OCTOBER 1959

American
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THE MAGAZINE OF GAS DISTRIBUTION

DIARY OF AN INDUSTRY

A CENTURY OF PROGRESS IN GAS DISTRIBUTION

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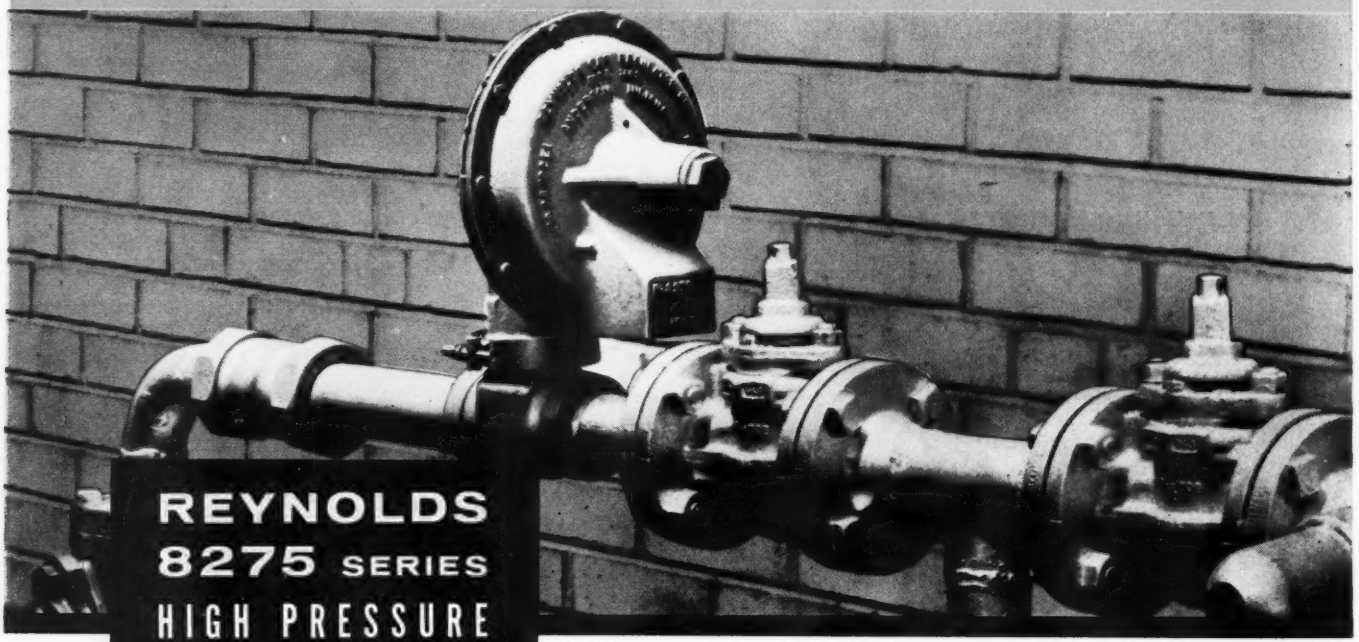

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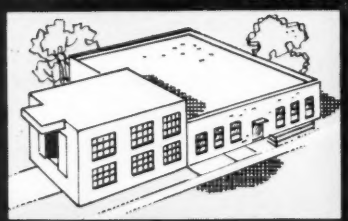

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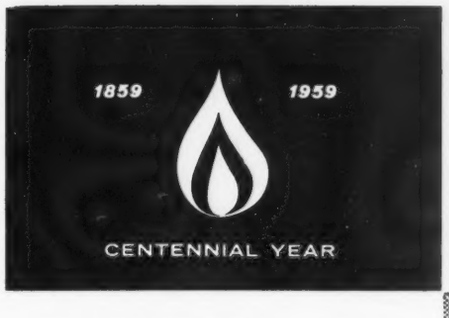

American Gas Journal

ONLY MAGAZINE EDITED EXCLUSIVELY FOR THE GAS DISTRIBUTION INDUSTRY

Volume 186 October 1959 Number 11

PILOT.. ..LIGHTS

Do You Know . . .

. . . where the first gas light was used in the U. S.?
. . . who invented the gas meter?
. . . which gas company is the oldest in the U. S.?
. . . when telemetering was first used? (See page 28 for a real surprise.)
. . . what kind of gas lights were used before Welsbach discovered zirconium and developed the incandescent mantle?
. . . when the first "home service" department was established?
. . . when the gas refrigerator was developed?
. . . when gas was **first** used for refrigeration?
. . . when the first "house regulator" was patented?
. . . when the Weymouth flow formula was introduced?
. . . when and where gas was first successfully stored underground?
. . . when the wheel-type trencher was developed?
. . . when portable air compressors were introduced?
. . . when welding was first used on a gas line?
. . . when automobiles first came into use by gas companies — and what they were used for?
. . . that there once was a gas toaster? A gas coffee roaster? A gas iron? Gas nursery heaters?
. . . where the first natural gas line was laid? Or what kind of pipe they used?

You'll find the answers in this issue — in *"Diary of An Industry,"* AGJ's special 100th Anniversary feature.

IN THIS ISSUE . . .

SPECIAL ANNIVERSARY ISSUE FEATURES

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A chronological history of the gas industry, the men who built it, the ideas they developed, the companies they organized, and abstracts of items from the pages of American Gas Journal — the dramatic and the humorous, the commonplace and the unusual — that have been chronicled in its century of service to the gas industry

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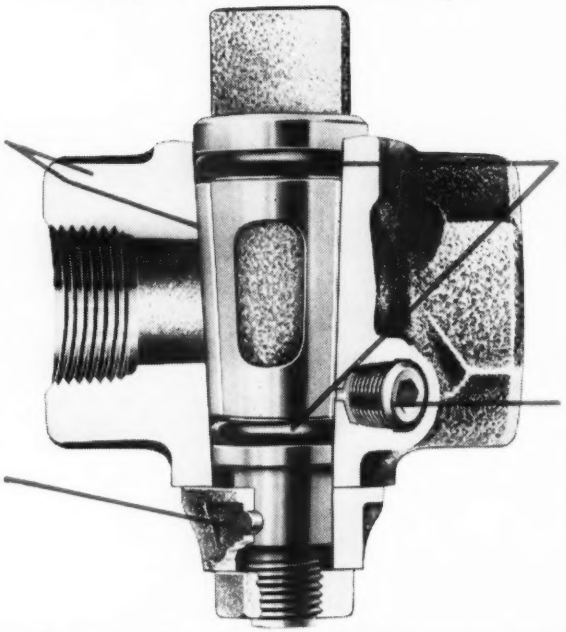

"O" rings at top and bottom of key provide dependable seal to prevent leakage to the atmosphere.

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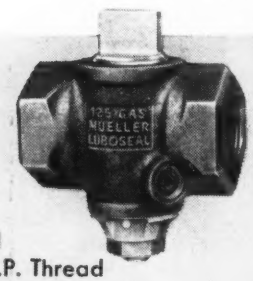
iron body, bronze key—working pressures to 125 psi



H-11170
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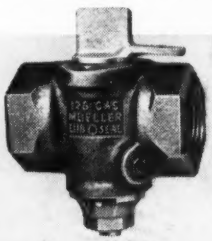
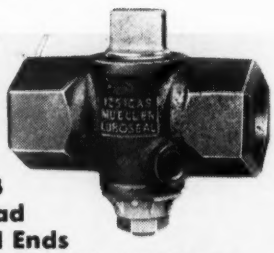
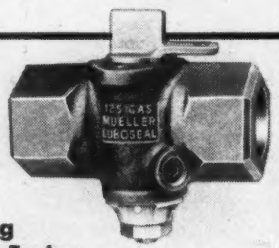
Inlet: Inside I.P. Thread
Outlet: Inside I.P. Thread
Finish: Black or Galvanized
Sizes: ¾", 1", 1¼", 1½", 2", 2½"



H-11175
Lock Wing
Inlet: Inside I.P. Thread
Outlet: Inside I.P. Thread
Finish: Black or Galvanized
Sizes: ¾", 1", 1¼", 1½", 2", 2½"



H-11173
Plain Head
Recessed Ends
Inlet: Recessed Inside I.P. Thread
Outlet: Recessed Inside I.P. Thread
Finish: Black
Sizes: ¾", 1", 1¼", 1½", 2"



H-11178
Lock Wing
Recessed Ends
Inlet: Recessed Inside I.P. Thread
Outlet: Recessed Inside I.P. Thread
Finish Black
Sizes: ¾", 1", 1¼", 2"

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Re-lubricating Tool
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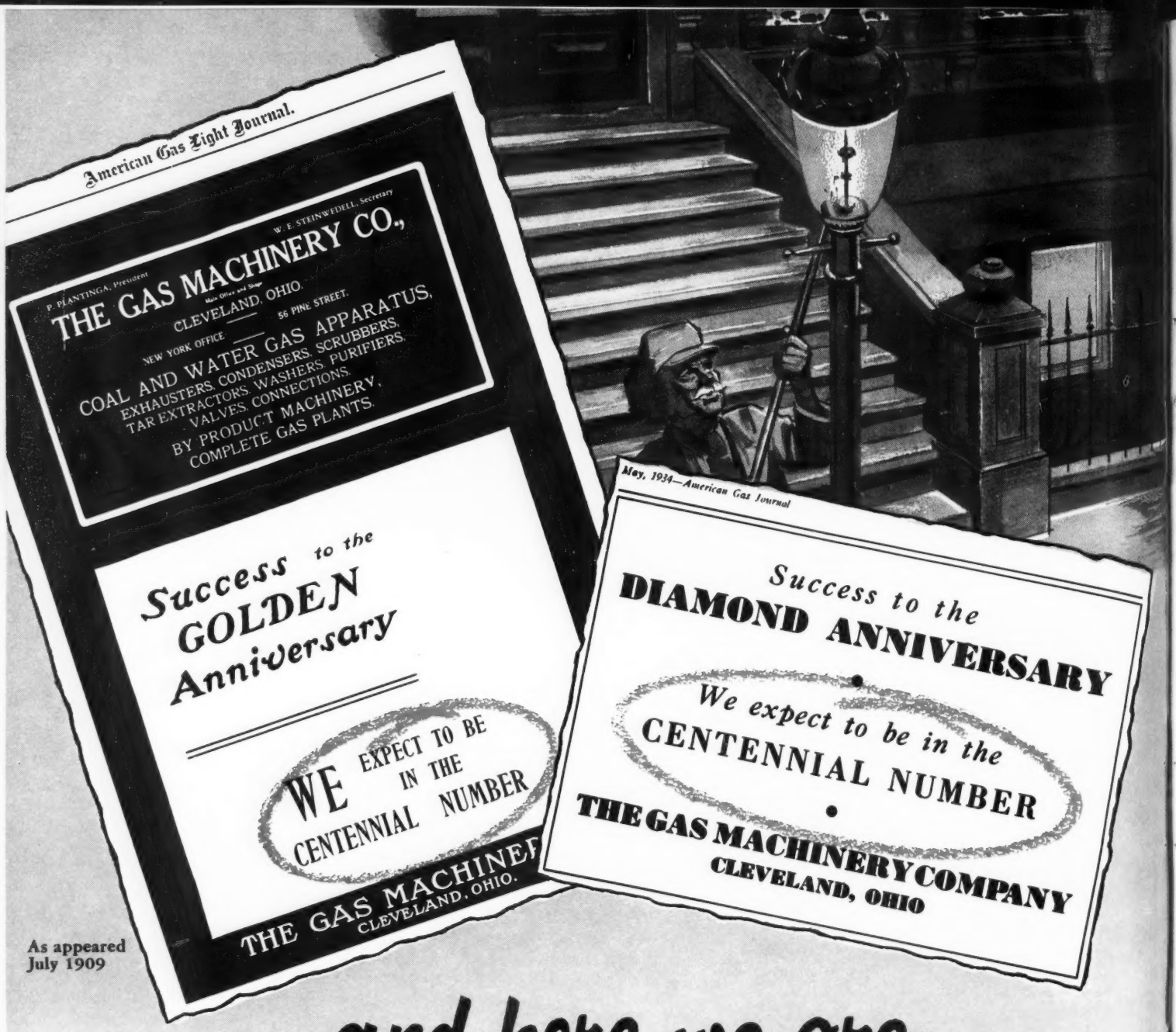

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July 1909

. . . and here we are

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Honorary Chairman of the Board

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M C F

NEWS HILITES OF THE INDUSTRY

Frigidaire Division of General Motors Corporation has announced plans to enter the gas dryer business with four new automatic models. The gas dryers, to be produced at Dayton, Ohio, will be the first gas appliances to be offered by Frigidaire. The announcement has brought increased speculation that the GM division may later produce and market a full line of gas appliances. *(In 1932, a GM subsidiary, Faraday Refrigerator at Dayton, produced a gas-fired absorption model refrigerator. The venture, promoted in one of the worst years of the depression, was short-lived.)*

Pacific Gas Transmission Company's plan to import 456,000,000 cu ft per day from Canada is scheduled for an October 15 hearing by the FPC. Firms involved in the hearing include Pacific Gas & Electric Company, parent firm of PGT; Pacific Northwest Pipeline Company, for whom PGT would transport up to 151,731,000 cu ft daily from Canada, and Montana Power Company, also seeking to import Canadian gas.

Four eastern utilities are considering building a coal pipeline. Article in *New York Times,* September 15 noted that Consolidated Edison Company of New York, Public Service Electric and Gas Company of New Jersey, Pennsylvania Power and Light Company of Allentown, Pennsylvania, and Philadelphia Electric Company have been approached in recent weeks with a plan to receive the bulk of their heavy coal needs through a 24-in. pipeline linking them to West Virginia coal fields. Line would be built by Texas Eastern Transmission Corporation. Consolidation Coal Company of Pittsburgh would supply the coal. Talks are still in the preliminary stage.

Contrast. *In Colorado Springs, Colorado,* District Judge G. Russell Miller has held that Colorado Interstate Gas Company is not a public utility. The transmission firm had asked the court to set aside a ruling by the Colorado PUC declaring that the pipeline company was a public utility and gave the PSC power to regulate CIG's direct sale of natural gas to industrial firms and municipalities. *In Los Angeles, California,* the California PUC has declared Richfield Oil Corporation a "public utility gas corporation" subject to its jurisdiction. Richfield built a $5,000,000 gas pipeline to serve, and is currently selling gas to, Southern California Edison Company's steam-electric generating plant in Ventura County.

Surplus natural gas in Pakistan may be exported to Japan in the form of liquefied methane. Preliminary studies of potential markets in Japan by Sui Gas of Karachi, Pakistan, in conjunction with Constock International Methane, Ltd., have shown encouraging results and detailed surveys are now underway in Japan and other Far Eastern countries.

Gas produced by underground coal gasification is now powering a 3750-kw power station near Chesterfield, reports *The Gas World,* gas industry publication in Great Britain. Process involves firing of coal seams with primary air blown into the underground area to produce the gasification reaction. An entirely new system — utilizing intersecting vertical and horizontal boreholes — is being used to eliminate underground piping. Air is blown down one set of vertical boreholes to a "gallery" at the coal seam level; the gasification reaction takes place in previously fired coal seams and the gas travels along horizontal boreholes in the seam and back to the surface via vertical uptakes, and then to the power station via surface mains. Cooling of the gas (a pilot plant) is by direct injection of water. In larger plants, notes the publication, conventional gas cooling equipment would be used.

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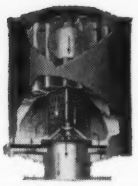
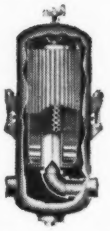


INTAKE FILTERS



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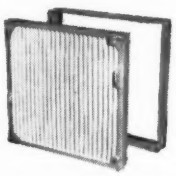

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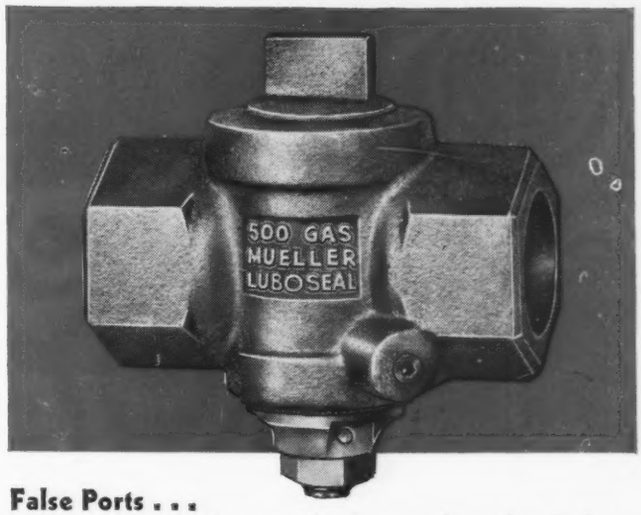
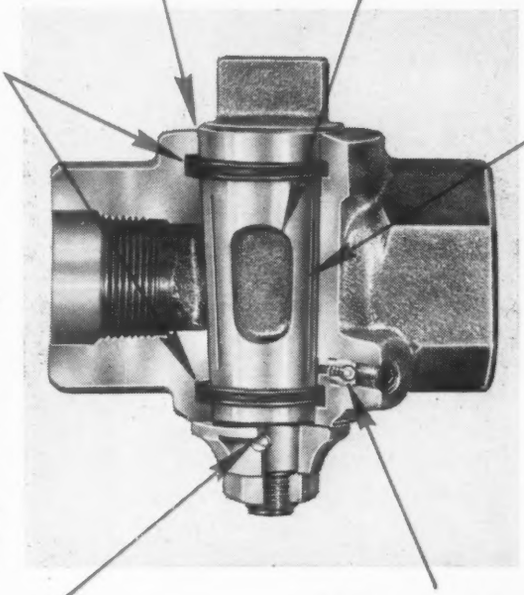
...ground key surfaces and "quad-rings" provide pressure seal



False Ports . . .
False ports in the key and body are aligned with the true ports in the body and key when the stop is in the closed position. This prevents grit or dust in the gas from settling upon the polished sealing surfaces and later damaging them when the key is turned to open the stop. Seating contact is reduced to only those areas where it is useful, resulting in an easier turning stop.

Ground and Lapped Body and Key . . .
Ductile iron has excellent machining qualities, therefore the body and key can be accurately machined and **individually** ground and lapped for a precision, gas-tight fit.

Quad-Ring Seals . . .
Top and bottom of the key are positively sealed by quad-rings located in annular grooves in the stop body. The quad-rings also pressurize the lubricant — deflecting as the lubricant reservoir is filled and expanding to keep pressure on the lubricant as it is used.



Ductile Iron Body and Key. . .
The corrosion resistance of cast iron with the strength, impact and fatigue resistance of steel — all these advantages are incorporated in the 500 pound LubOseal Ductile Iron Stop. The body threads are recessed for extra strength and rigidity. Body ports are tapered to meet the straight way in the key, providing smooth flow and additional strength.

Lubricated Key For Easy Turning and Pressure Tightness . . .
The lubrication system of LubOseal Stops maintains a proper grease film on the seating surfaces, assuring easy turning and pressure tightness. Four vertical grooves in the key distribute the lubricant over the ground and lapped surfaces each time the stop is operated. The quad-rings in the circular grooves and the entire seating surface between these grooves are fully lubricated. In any position other than fully "opened" or fully "closed", the vertical grooves are disconnected from the circular reservoir grooves, preventing the line pressure from forcing the grease out of the lubricant system.

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A heavy bronze washer is secured to the lower end of the key by a drive-lock pin in a blind hole, thereby permanently maintaining the perfect adjustment between the key and body. Stop is operable with the stem nut removed or with the nut over-tightened to the point of stripping the threads, providing an additional safety feature.

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The grease port is located so that a ground and lapped seating surface is between it and the main gas port, preventing any leakage. A spring loaded, ball-check grease fitting provides a second seal. The socket head pipe plug forces grease through the grease fitting into the entire lubricating system and provides a third and final seal!

H-11180 Solid Head
Sizes: ¾", 1", 1¼", 1½", 2"

H-11185 Lock Wing
Sizes: ¾" and 1"

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This rugged unit has 14,000 pounds breakout power. Tears through hard or frozen ground and blacktop. Its high operating pressure (2150 psi), extra large bucket cylinder, 200° continuous operating arc, easy-to-operate controls, and direct-to-the trench vision let you work faster and more accurately than with any other backhoe.

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It uses the same hydraulic system as the famous Massey-Ferguson Davis Loader. Both are designed as integrated attachments to Massey-Ferguson's Work Bull 202 and 204 Industrial Tractors — by far, the most popular tractor-loader-backhoe rig today!

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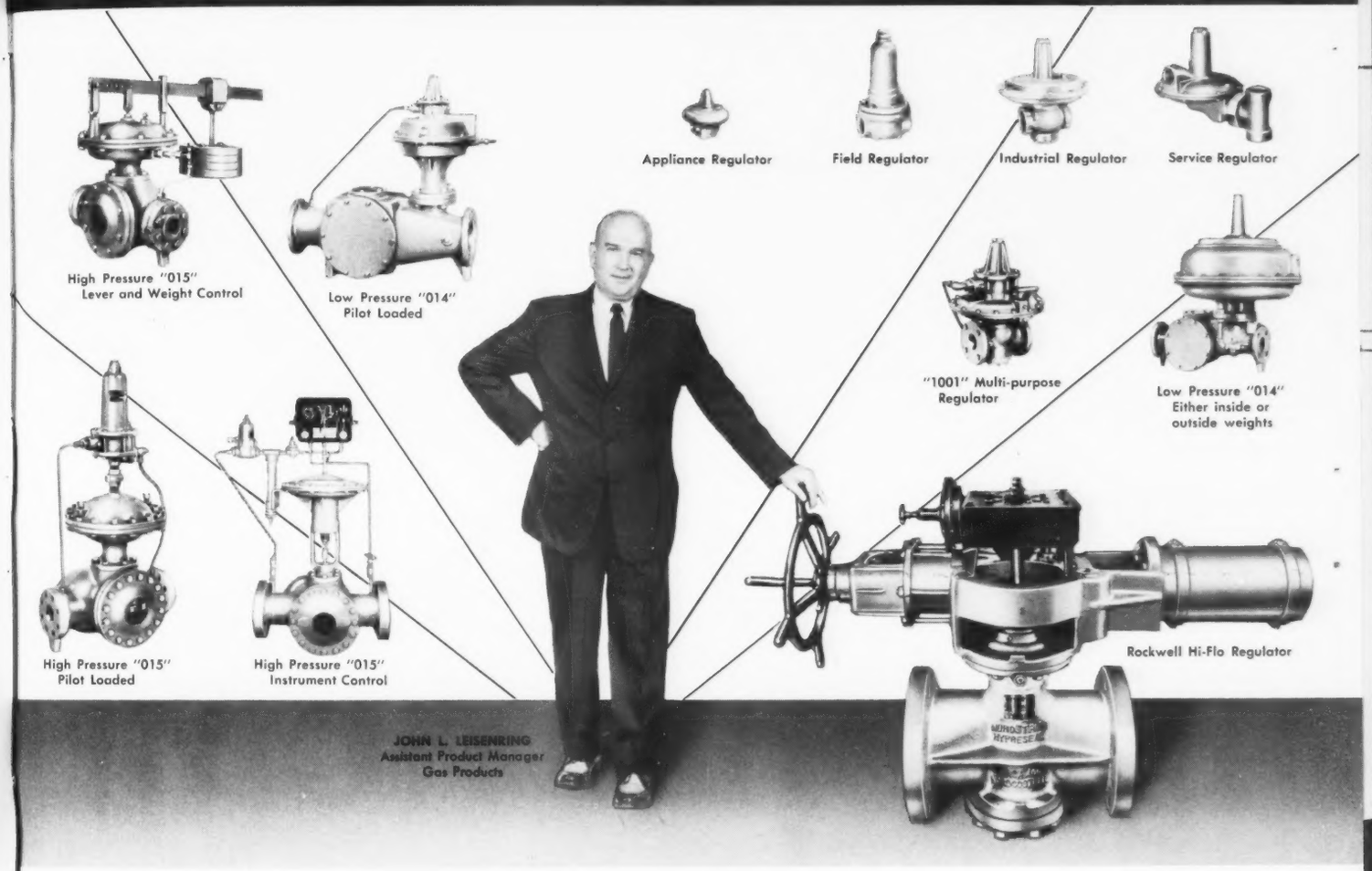

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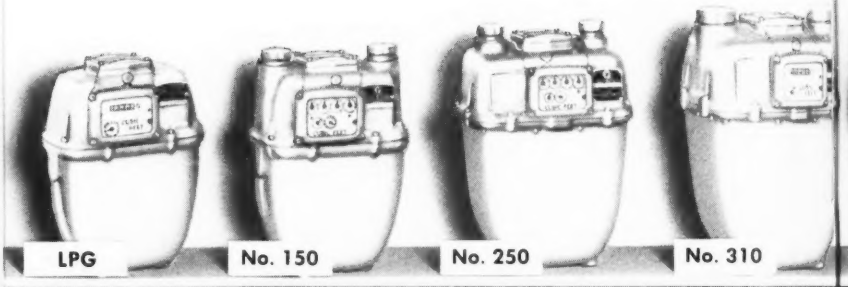
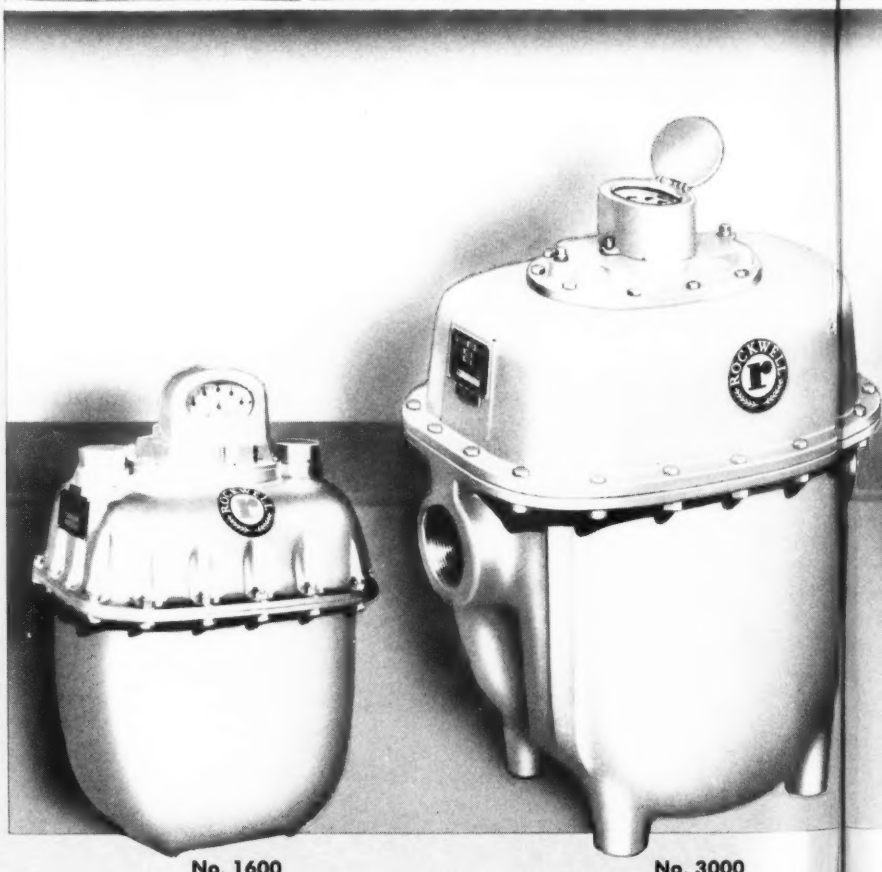
SAFETY

Rockwell invites you to benefit by selecting from the only complete line of aluminum meters, made to precision standards, in every capacity rating needed for homes or industry. The light weight of these meters is only an initial advantage although it does offer substantial savings in shipping, handling and setting. Other advantages you'll appreciate are the safety of single joint construction and the impact and corrosion resistance of sturdy aluminum alloy cases.

Don't forget—all Rockwell aluminum meters, in all sizes, are made with inner mechanisms that can be removed and replaced as units to simplify your maintenance operations. Another advantage you gain by standardizing on Rockwell aluminum meters is that many parts interchange between one size meter and another. This feature can materially reduce meter shop inventories.

For your convenience Rockwell aluminum meters are identified by their capacity ratings. Meters from the No. 150 through the No. 750 are rated at ½" pressure differential; the larger sizes—No.'s 1600, 3000, 5000 and 10,000—are rated at 2" differential and operate at up to 100 psi. Rockwell Manufacturing Co., Pittsburgh 8, Pa.





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AVAILABLE NOW!

CAPACITY	3000 cfh*
WEIGHT	100 lbs
WORKING PRESSURE	100 psi
DIMENSIONS	21" end to end x 16" wide x $26\frac{25}{32}$" high

*Rated at 2" diff. of 0.60 sp. gr. gas

SEE INSIDE FOR DETAILS ON THE ONLY COMPLETE LINE OF ALUMINUM METERS TO FIT EVERY EXISTING NEED

ONLY the ROBERTSHAW UNITROL 400R features DEMONSTRATION to help you sell water heaters!

appearance catches their eye...

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as seen In
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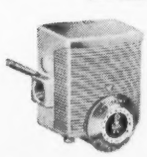
...and demonstration sells them! Specify the amazing new Robertshaw Unitrol 400R with the exclusive slip-top cover and the flip-top lid so that your sales people can *demonstrate* your water heater! (In addition, Robertshaw Unitrols with built-in pressure regulators increase gas burner ratings and improve ignition performance.)

UNITROL 200R (with built-in pressure regulators)



UNITROL 110R (with built-in pressure regulators)

UNITROL 400

UNITROL 200

UNITROL 110

There is a dependable Robertshaw Unitrol for every water heater you manufacture

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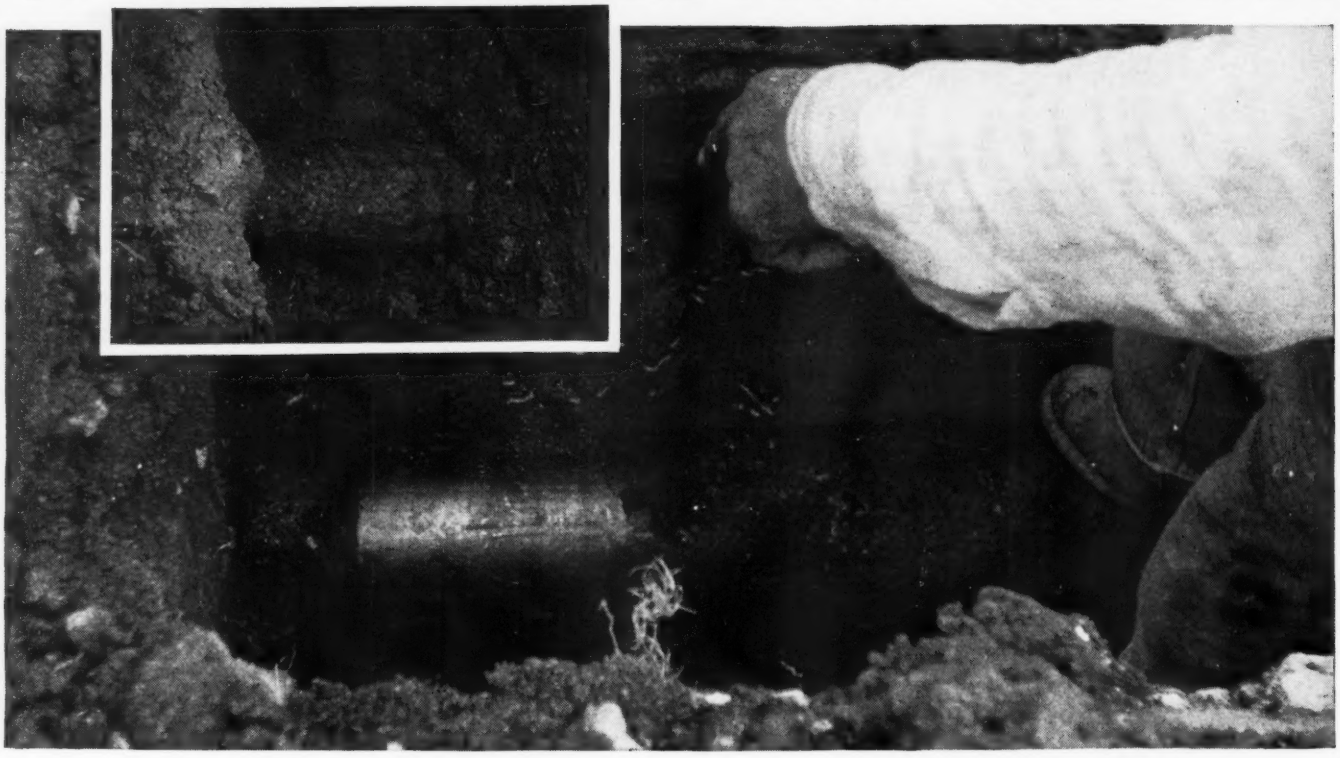
17-YEAR PROTECTION RECORD!



Year After Year...More Evidence Proving That TAPECOAT® Adds Years of Service Life to Gas Lines Underground or Under Water

Right across the country, TAPECOAT installations prove that you get more for your money when you measure pipe protection with a calendar.

Since this cost-cutting coal tar coating in tape form was first introduced in 1941, it has demonstrated its ability to withstand severe conditions underground or under water. TAPECOATED lines dug up after 17 years of service show no signs of deterioration on the pipe.

Typical is the experience of a utility in a coastal area. For a thorough trial, this company applied TAPECOAT in areas where severe corrosive conditions were known to exist. The lines were dug up this year and, after years of service under severe conditions such as brackish waters and corrosive soil, the pipe showed no signs of corrosion, proving the quality of TAPECOAT protection.

In terms of preventive maintenance and replacement costs, performances like this emphasize the most important consideration in buying protection. Remember, TAPECOAT is a hot-applied coal tar coating in tape form—designed for lasting protection on pipe, pipe joints, service connections, mechanical couplings, fittings, insulated lines, tanks, tie rods, and other steel surfaces vulnerable to corrosion.

TAPECOAT comes in rolls of various widths and is available in asphalt. Where primer is desired, specify TC Primecoat, the compatible coal tar primer.

A TAPECOAT sales and service engineer is always available to help you on any corrosion problem. Write for complete details today!

The TAPECOAT *Company*

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SKINNER-SEAL

BELL JOINT CLAMP

When you clamp a bell and spigot joint, you want PERMANENCE. In the SKINNER-SEAL Bell Joint Clamp, massive malleable iron construction, gasket SEALED by monel metal band, oversize corrosion-resistant bolts . . . combine to make a tight, lasting, completely reliable installation. Four-page folder with drawings, photographs, specification tables, sent free upon request.

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Pushbutton PRESSURE CONTROL to meet Changing gas demand

FISHER *TYPE*

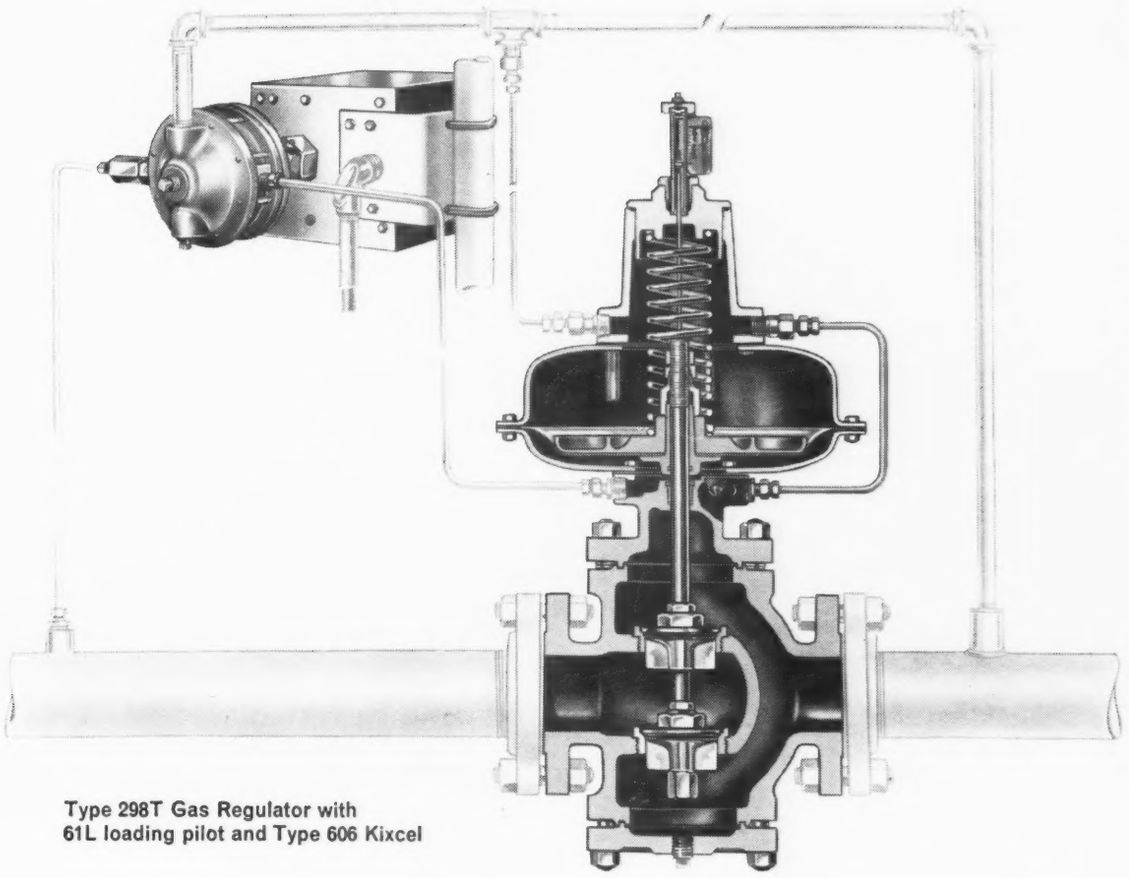
From a remote station Kixcel Type 606 raises or lowers pressure set-point to satisfy change in gas demands.

High and low pressure limits can be set at any point throughout pilot spring range. (Pressure ranges from ¼ to 2 psi; 2 to 10 psi; 10 to 20 psi; 10 to 65 psi.) Also available for high pressure loading pilots up to 300 psi.

Quick, easy manual adjustments without changing pressure limit settings.

Various gear ratios available for different rates of pressure change settings.

IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD . . . CHANCES ARE IT'S CONTROLLED BY . . .



Type 298T Gas Regulator with
61L loading pilot and Type 606 Kixcel

606 KIXCEL

Once again Fisher engineering steps in to help the Gas Man provide better service to his customers at the same time achieving greater efficiency at the distribution station.

With fingertip control the Kixcel Type 606 raises or lowers the pressure set-point of the Fisher Type 298T loading pilots even though the central control station is miles away from the regulator station. Kixcel Type 606 is also available for other Fisher pilot operated regulators.

The operator's commands are transmitted by either conventional telemetering control or by a polarized DC signal sent over a pair of telephone wires.

The Kixcel Type 606 is encased in a rugged, weather-proof cover and will withstand all outdoor temperatures.

Write for complete details.

FISHER® Controls
SINCE 1880

FISHER GOVERNOR COMPANY
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BUTTERFLY VALVE DIVISION: CONTINENTAL EQUIPMENT CO., CORAOPOLIS, PENNSYLVANIA

Designed for utilities, the Barber-Greene Runabout digs only the size trench required—no excess material to backfill. Also pulverizes material, simplifying backfilling. Write for complete information.

Helping to halt the rising cost of gas distribution

Distribution costs of gas utilities continue to rise. This is partly due to their specialized requirements and the need for specialized tools. For service ditching, there is a special machine designed specifically for the peculiar needs of utilities—the Barber-Greene Model 705-B Runabout.

Runabout advantages

- It travels to the job under its own power. No trailer required.
- Digs straight down, jumping walks and other obstructions . . . leaves no ramps to be dug out by hand.
- Exclusive Hydra-Crowd transmission gives an infinite selection of digging speeds to 16 feet per minute. No stopping to shift speeds. Assures maximum speed in any soil.
- New curved digging teeth give three times longer life.
- Rugged construction allows it to dig where other machines fail, and cuts maintenance costs to minimum.
- Easily operated from cab or ground. Finger-tip controls.

The Runabout is just one of Barber-Greene's line of wheel, ladder, and vertical boom ditchers.

No trailer needed with the Barber-Greene Runabout Ditcher. It speeds from job to job under its own power. Ready to dig on arrival.

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Extra Tough, Extra Durable

AMERICAN Ductile Iron PIPE

For Gas Service

With American Ductile Iron Pipe, there's no need to worry about tough treatment. American Ductile Iron actually bends under stress . . . and has the strength to withstand high internal pressures, heavy crushing loads, extreme shock. It stands up to tough treatment in shipment, in installation, in service.

Produced from a new family of cast metals, American Ductile has steel-like strength plus the proven corrosion resistance of gray cast iron. With American Ductile, there's no inconvenience and expense of special wrappings and other protective devices.

Extra tough, **extra** durable, American Ductile Iron Pipe is manufactured with extra safety factors to meet the super-service requirements of modern gas distribution.

Get full details on American Ductile Iron Pipe . . . its durability, ease of installation and tapping, its bottle-tight American Double-X Mechanical Joint . . . from your nearby American Cast Iron Pipe Company representative now.

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This PITT CHEM protected gas main is going underground for the rest of your life!

ONE of the most practical and economical steps you can take to insure against costly distribution line failure is to use the proven protection of quality *coal tar* coatings.

And when it comes to coal tar coatings, more and more gas companies are depending on PITT CHEM Enamels—protection that has been proven over the years on major transmission lines and distribution lines alike. No other material can do a better or more economical job of resisting soil stress and water absorption.

When you specify PITT CHEM Enamels for your distribution lines you're providing maximum protection for one of the biggest investments you make.

Call on us for the services of a PITT CHEM man to help you plan your next distribution line protection program. He's an experienced coating man, ready to give you or your mill coater valuable technical assistance.

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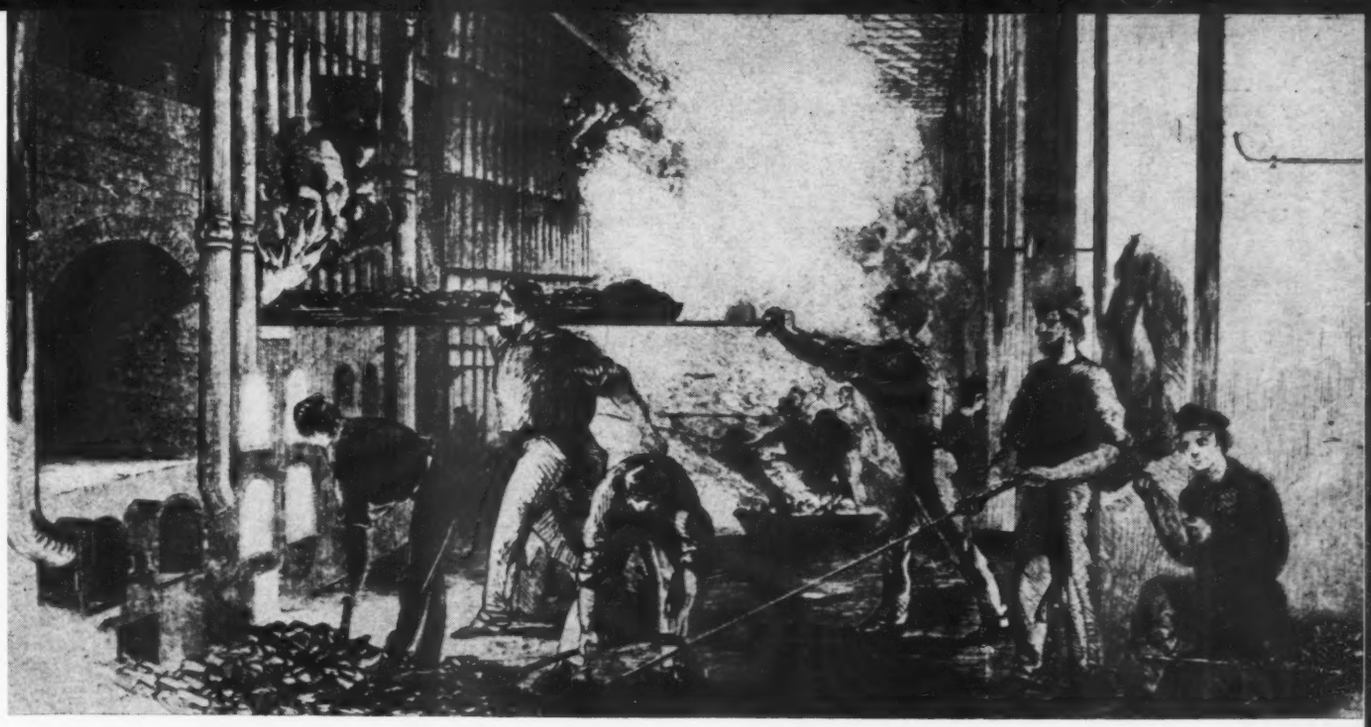

Diary of an Industry

By
Dean Hale, ***Editor***
and
Pat Loar, ***Assistant Editor***

Where did the history of the gas industry really begin? In the 10th century in China, where gas was piped through bamboo? Or was it in Japan in the 7th century, when wells were drilled for natural gas? Or with the famed Greek oracle at Delphi, where men breathed gas and became light-headed? Perhaps if man had begun recording his history earlier, it might have been in what we call prehistoric times.

There might not be a gas industry today — or even civilization — if man had not made two important discoveries . . . that food tasted better when cooked . . . and that the fire used for cooking also gave light. These two discoveries ultimately led man to seek and find better ways to produce heat and light . . . to warm him, cook his food, and illuminate the night.

To an erstwhile alchemist named Baptist Van Helmont, of Brussels, we owe the name "gas." In 1577, Van Helmont was heating material in a crucible in his crude laboratory when a "wild spirit or breath" burst forth. He promptly named it "geist," a German name that literally means "ghost or spirit." Thus "gas" was named.

Man was slow to learn more about gas. Experiments by Clayton in 1660, Dixon in 1760, and others led to Murdoch's discoveries in 1792. Thanks to Murdoch, progress speeded up. By 1812, Winsor had promoted the first gas company in the world — in London; in Baltimore, Peale established the first gas company in the U.S. in 1816. By 1859, when AMERICAN GAS LIGHT JOURNAL was founded, over 300 U. S. cities were lighted by gas, and natural gas was no longer a curiosity, but a generally useful product even if it wasn't very good for illuminating purposes. For nearly a century after Peale lighted Baltimore, illuminating (manufactured) gas ruled the industry. Not until gas was adopted generally for cooking, space heating, water heating, and 1001 industrial uses did natural gas come to the fore.

In the following pages you'll find a chronological outline of the history of the gas industry, compiled from the pages of AMERICAN GAS JOURNAL. It is by no means a complete history of the industry . . . such an undertaking would require volumes. It is, rather, a brief but comprehensive guide that highlights important events, spiced with touches of drama, humor, and tragedy.

Supplementing this work, we've included in this issue a reprint of our first issue so that you may compare the interests of the gas man of 1859 with those of his contemporaries of a century later.

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by American Gas Journal

Diary of an Industry

615 A.D.
Gas wells were known in Japan.

900 A.D.
Chinese reported piping gas through bamboo tubes, use it for lighting.

1670
First record of coal gas mentioned in writings of Reverend John Clayton, a Yorkshire Minister, who experimented with distilling coal.

1691
Robert Boyle reported in England that a combustible gas is produced when coal is heated.

1769
Nicolas Joseph Cugnot built first self-propelled vehicle—a 3-wheel carriage driven by steam.

1775
General George Washington describes a "burning spring" on the Kanawha River in West Virginia adjacent to a tract of 123 acres granted to him and General Andrew Lewis.

1781
French chemist Lavoisier invented the gasometer, which later developed into the gas holder. He later invented the first portable light by filling bags of leather, bladders and vessels with gas, lighting them and carrying them from place to place.

1784
Cavendish discovers composition of water; this was to play an important part in the manufacture of water gas in later years.

1792
William Murdoch, a Scot, lighted his house with gas produced by carbonization of coal, using a cylindrical pot that held 15 lb of coal, set in brickwork, and heated by an open fire. Gas was conducted through tinned iron and copper tubes a distance of 70 feet.

U. S. Congress established the mint in Philadelphia April 2.

1797
Murdoch installed coal-gas lighting in house of a friend in Ayrshire.

1798
Murdoch equipped Soho Foundry with gas lighting, and studied the washing and purification of gas.

1799
Philippe Lebon of Paris obtains first patent (September) for making of gas. Device called a "Thermolamp."

1802
Public display of gas lighting given at Soho Works.

1804
Frederick Albert Winsor, a German, obtains first English patents for the manufacture of gas, lectures publicly to overcome public prejudice.

1805
First recorded suggestion of the use of gas for cooking.

1806
First gas mains ever laid in a public street occurred when Winsor had pipes laid from Haymarket to St. James Street in London. Pipes were made of sheet lead.

1807
Winsor lights Pall Mall in London with coal gas, first successful demonstration of street lighting.

1809
Samuel Clegg invents "Argand" burner which uses two concentric tubes with gas in the space between the two rings.

1812
David Melville, of Newport, Rhode Island, successfully made gas in his home and lighted his house and the street in front of it. He was granted a patent in March, 1813, for his gas making machinery.

First gas company in England was chartered on April 30, known as the London and Westminster Gas Light & Coke Company.

1813
Melville introduces gas lights at a cotton mill at Watertown, Massachusetts, and at a mill near Providence.

1815
Samuel Clegg constructed his first gas meter—a "wet" type. It was not, however, a commercial success and was not adopted for many years.

Accum published the first "Treatise" on gas lighting; it included a description of the first gas plant, which consisted of two horizontal retorts with ascension pipes, hydraulic main, and a rectilinear holder. Gas was carried from the hydraulic main in a spiral pipe through the water tank of the holder (which served as a condenser) to a lime purifier with an agitator, and then back to the single lift holder. "Total length of pipe laid down as mains in the streets of London amounts already to nearly 15 miles."

First mains laid by Clegg were 2-in. in diameter, but were soon found to be too small, and were replaced by 4 and 6-in. mains. These were cast iron pipes made in 4½-foot, 6-foot, and 9-foot lengths. Wrought iron pipes were unknown. Services and house pipes were formed of old musket barrels. The muzzle of one screwed into the breach of the next. At the works, the rectangular holder (form adopted by Lavoisier) was retained until 1816 when the cylindrical form first appeared.

1816
Rembrandt Peale gives public demonstration of gas lighting at his "museum" in Baltimore on April 23. Baltimore City Council, on June 17, granted authority to the Baltimore Gas Light Company, organized by Peale and financial backers, to lay mains and provide street lighting.

1817
First public street gas lamp in Baltimore was lighted on February 7, 1817, at the corner of Market and Lemon Streets.

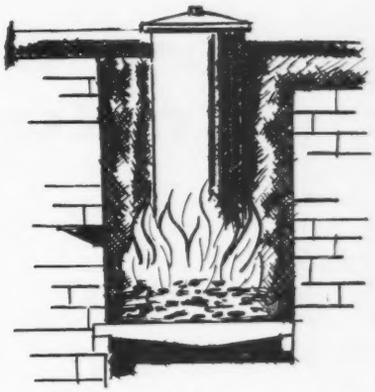
John Malam invented an improved type of "wet" gas meter that resulted in the construction of meters universally employed in the early days of the gas industry.

Melville used gas for lighting a lighthouse in the United States.

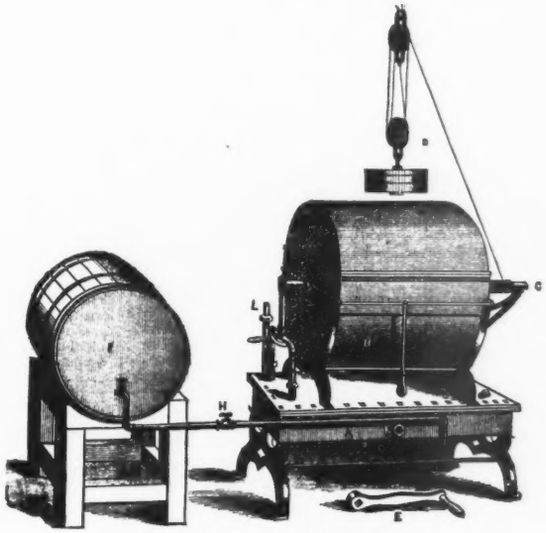
1819
First gas company formed in France to light the city of Paris.

Gas Making: From Crude Retorts to Fine Art

Gas works at Portland, Oregon, in 1860, was first in the Pacific Northwest.

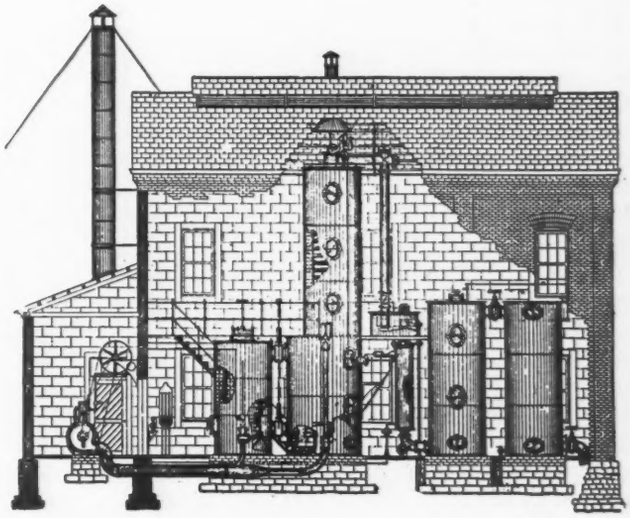


William Murdoch's simple coal gas apparatus provided gas to light his cottage.

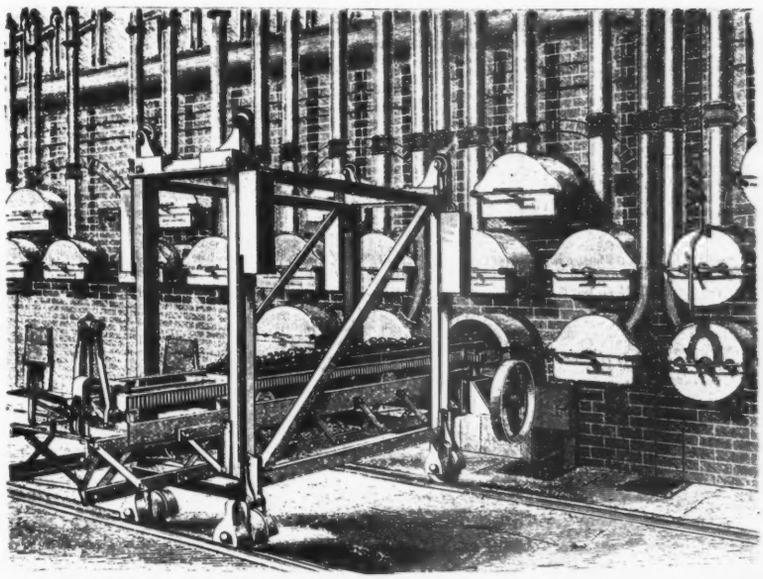


SOLAR GAS MACHINE.

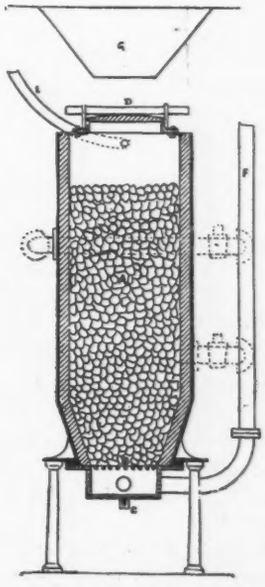
Solar Gas Machine (1867) was an oil-gas plant on small scale, suitable for use by business, industry, or the homeowner.



Water-gas set of the 1890's; a refined version of the apparatus developed by Prof. T. S. C. Lowe, which revolutionized gas making.



Machine stoker or charger in 1873 brought mechanization to gas making. This device was invented by Alonzo Haven of Brooklyn Gas Light Company.



First internally fired coal gas generator invented by Geo. Lowe of London in 1831.

Diary of an Industry

1820

Natural gas was discovered near Pittsburgh, Pennsylvania, by a salt works drilling for salt water. Gas was ignited accidentally and burned down the plant.

Malam invented a "dry" type gas meter, but it was not greatly successful.

Retorts of fire clay construction made their appearance.

Process of manufacturing "oil gas" was patented by Taylor and Martineau who secured an Act of Parliament (May, 1821) authorizing the erection of an oil-gas works in England.

1821

Natural gas discovered at Fredonia, New York, in the form of a "burning spring." Small boys playing on the banks of Canadaway Creek are said to have accidentally ignited the seepage of gas, and people of the village, thinking it too good a fuel to waste, drilled a well 27 feet deep and piped the gas through small logs to several nearby houses for lighting. This "log pipe" was later replaced by a ¾-in. lead pipe made by Wm A. Hart.

1822

Boston Gas Light Company is chartered by special act to serve the city of Boston and adjacent towns. First construction of gas plants was not undertaken until 1828 on a plot of land on Hull Street, at the Old North Station, and on January 1, 1829, the first public lamps were lighted in Dock Square.

1823

New York Gas Light Company is granted charter in March, organized on May 12 to serve the city of New York (population in 1823—145,000). Not until February 14, 1825, however, when fires were started in a small plant at the corner of Hester and Rhynder Streets did citizens of New York City receive gas. Gas sold for $10.00 per Mcf, and by September, 1825, over 1700 burners were installed.

In London, Samuel Brown successfully operated the gas vacuum (internal combustion) engine. In the same year, John Malam patented dry lime purifiers.

1824

First gas exhauster (a blower) was invented by Broadmeadow.

Principle of cathodic protection was described by Sir Humphry Davy. First wide-scale use on gas distribution systems of cathodic protections was to come 105 years later, in New Orleans.

1825

First patent for a gas regulator was granted in England to Samuel Crossley.

Brooklyn Gas Light Company was organized.

First record of the "gas stove"—described as a piece of gas apparatus for cooking by enclosing the circle of a gas flame with its reflecting cone in a cylinder of tin.

At Fredonia, New York, during a visit to the U. S., Gen. Lafayette arrived by stage coach at the old Taylor House at 2 a.m. on June 4 to find the city and the inn brilliantly illuminated in his honor by natural gas.

1826

Drummond, an Englishman, discovered and patented the oxy-hydrogen (lime-light) lamp.

1827

Berlin is first city in Germany to be lighted with gas.

1828

New York City's "Great White Way"—Broadway between Grand Street and Battery—is lighted by gas lamps.

John Brunton, chief engineer of West Bromwich (England) Gas Works, develops a vertical retort charging method; this method, however, did not come into use until nearly 50 years later.

1829

First gas holder using guide frames—and similar to latter day holders in design—was erected in London.

1830

Manhattan Gas Light Company organized in New York City.

James Sharp of Northampton, England, demonstrated the use of gas for cooking in his own house.

Peter Cooper in the United States secured a patent on the steam locomotive.

Morse patented the magnetic telegraph in the United States.

1832

Charter for gas light company in New Orleans granted to James Caldwell. System was not completed until 1835 when the city was first lit with gas lights.

First gas meter made in U. S. at Baltimore by Samuel Hill.

Bartlett-Hayward Company established.

1833

First telescopic gas holder erected at London. Hutchison, engineer of the company, laid claim to (and patented) the invention, on October 12, and from that period on, because of the extended applications of gas lighting, and the limited sites of the works, telescopic holders were used.

Richard Barnes secured a patent for heating of buildings by combustion of gas or oil.

1834

First pipe foundry established at Millville, New Jersey; produces first U. S.-made cast iron pipe used in gas distribution systems.

City of Philadelphia decides to build its own gas works, begins erection of plant at 22nd and Market Streets. This was first "municipal" gas system in the U. S.

In Evansville, Indiana, a gas light company is organized.

1835

Pittsburgh, Pennsylvania, gas light company is organized.

1836

Gas light companies organized in Mobile, Alabama, and Monroe, Michigan.

Philadelphia put its gas works into operation on February 8, with 19 private lamps on its lines and gas selling at $3.50 per Mcf.

Samuel Down opened meter shop in New York City.

1837

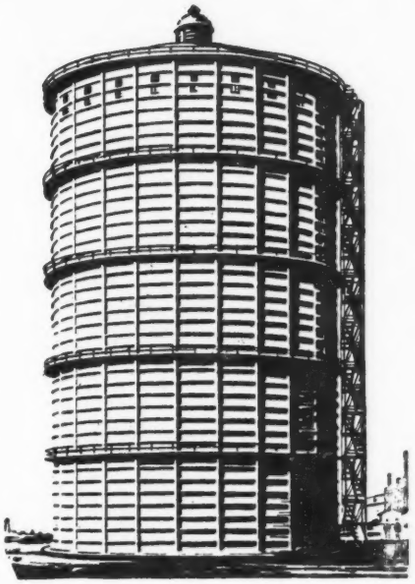
Charter granted to organize a gas-light company in Cincinnati, Ohio; operations finally got underway in 1841.

1838

Louisville, Kentucky, gas light company is organized.

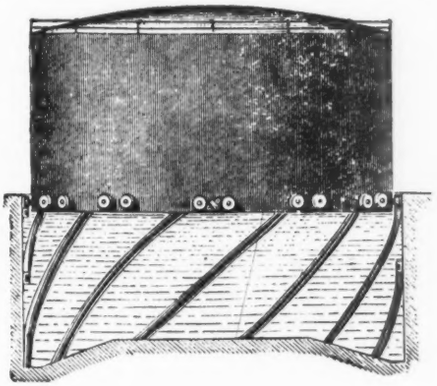
Ohio's first reported use of natural gas occurred on farm near Findlay. Natural gas, found when a water well was dug, is carried via wooden pipes to the farmhouse and lighted off the end of a gun barrel.

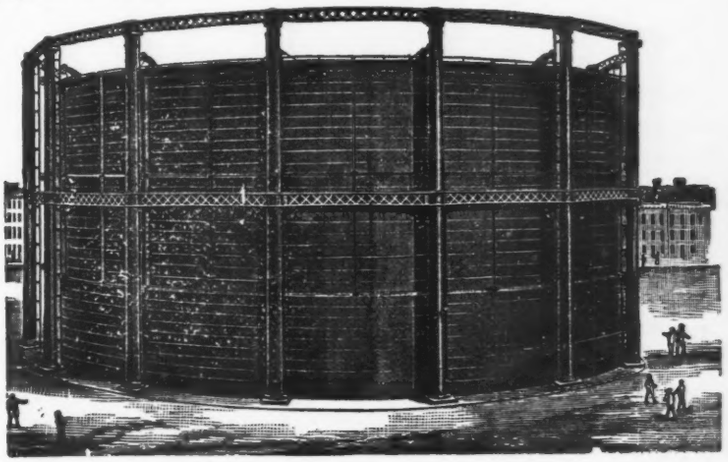
Holders: Barrels Gave Way to Steel Plate



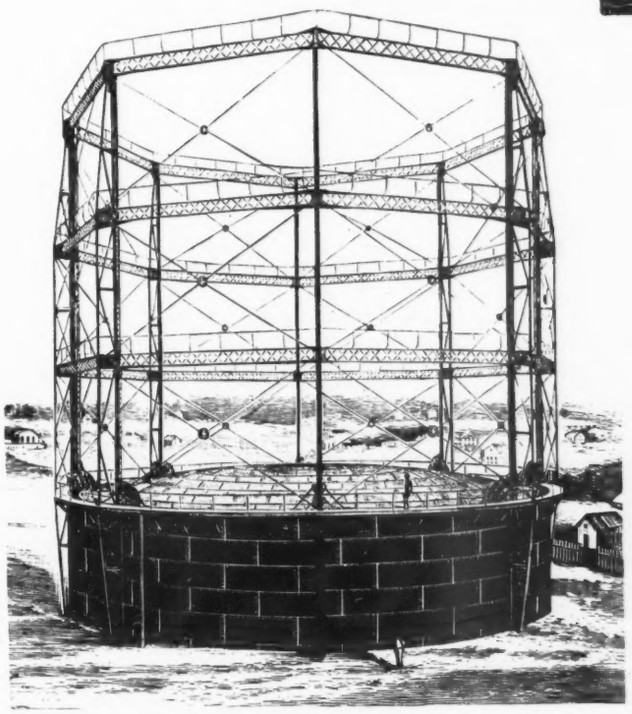
Dry seal gas holder was introduced in U. S. in 1924, was built in sizes up to 20,000,000 cu ft capacity.

Spiral-guided holder (below, left) needed no above-ground guides, invented in 1887 by Wm. Gadd of Manchester, England, was never popular in U. S.

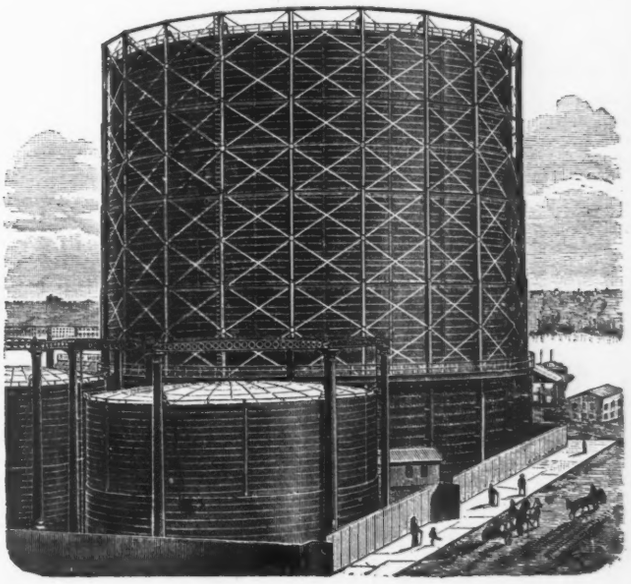




Stationary holders were popular in late 1870's.



Three-lift riveted steel gasholder of 1888 had horizontal tank bottoms resting on cement foundations; entire weight of guide frames were supported by tank side plates.



Three-lift steel web-type guide holder of 1894 in background, contrasted to small stationary types in front.

Diary of an Industry

1839

St. Louis Gas-Light Company chartered in February. Gas works finally put into operation 8 years later, in 1847.

1840

Gas meters began to be used. The idea of selling gas by the measure — instead of flat rate — originated with the Chartered Gas Light Company of London, which also was the first company to employ "cost of service" elements of business with the inauguration of a rental charge to customers for gas meters. Usual charge was 10 percent of the cost of the meter, including fittings.

Natural gas was reported used for first time in Pennsylvania for evaporation of brine in the refining of salt, by John Criswell, at Centerville, Butler County. This is the first recorded use of natural gas as a fuel for manufacturing.

1841

William Thompkins, while boring a salt well, struck a large flow of natural gas; the site was not far from George Washington's "burning spring" in the Kanawha Valley of West Virginia. Thompkins piped the gas to his salt works and used it instead of coal to boil down the brine.

1843

Halifax, Nova Scotia, organizes a gas light company.

1845

Gas light companies are organized in Albany, New York, and Painesville, Ohio.

Simplified 2-diaphragm meter invented.

1846

Charleston, South Carolina; Newark, New Jersey, and Cleveland, Ohio, gas light companies are organized.

1847

Five more gas light companies are organized — in Trenton and Patterson, New Jersey; Milwaukee, Wisconsin; New Haven, Connecticut, and Fall River, Massachusetts.

1848

Dayton, Ohio, Gas Company is organized; first gas is made in 1849 from refuse grease obtained from slaughter houses, is distributed through mains made of stove pipe coated with 2½-in. of lime mortar.

Gas light companies also reported organized or operating in Providence, Rhode Island; Reading, Pennsylvania; Syracuse and Buffalo, New York; Washington, D.C.; Zanesville, Ohio; and Springfield, Massachusetts.

Platinum mantles for gas lights are used in Paris.

Elsner developed a non-luminous gas burner for cooking purposes; device wasn't satisfactory, ended up as a heating stove for churches.

1849

Edwards granted patent in England for his form of stove, called "Gas Fire," that consisted of lumps of incombustible material heated to near incandescence by gas burners, so as to resemble a coal fire. *(Very similar to 1959's gas-fired charcoal-type broilers!)*

Gas light companies reported organized in at least a dozen U. S. cities — including Portland, Maine; Hartford, Connecticut; Worcester, Lowell, and Lawrence, Massachusetts; York and Lancaster, Pennsylvania; Detroit, Michigan; Savannah, Georgia; Great Falls, New Hampshire; Utica, New York, and Chicago, Illinois.

Chicago in 1850 when gas lighting was new.

1850

Manufacturing of gas began in Chicago on August 28 by the Chicago Gas Light & Coke Company, which had 125 private customers, 99 street lamps, and one public building on its lines. Gas sold for $3.00 per Mcf.

1851

Dr. Pole's formula for calculating the flow of gas in pipes at low pressure is developed and presented to the gas industry.

George Stacey, Cincinnati, organizes company to build gas holders and other apparatus and perform general iron fabrication.

1852

For first time, gas lights outnumber oil lamps in New York City.

California's first gas company, San Francisco Gas Company, is formed on August 31.

1854

First water gas apparatus patented in U. S. by John and Thomas Kirkman.

1855

Charter granted on February 12 to The Peoples Gas Light & Coke Company of Chicago. Charter was first to include provision establishing maximum rates to be charged— $2.00 per Mcf for the city, $2.50 per Mcf for private customers.

Bunsen patented his famous gas burner — designed to produce heat rather than light.

Harlem Gas Light Company is organized in February to serve area of New York City above 79th street — including villages of Harlem, Yorkville, Manhattanville, Carmansville, and Bloomingdale.

1856

Bessemer developed and patented his process for manufacturing steel.

1857

Panic of 1857 slows development of gas light companies in many cities as money is difficult to obtain for financing.

Patent granted for heating — by use of gas — of irons for laundry work.

Mueller Company established.

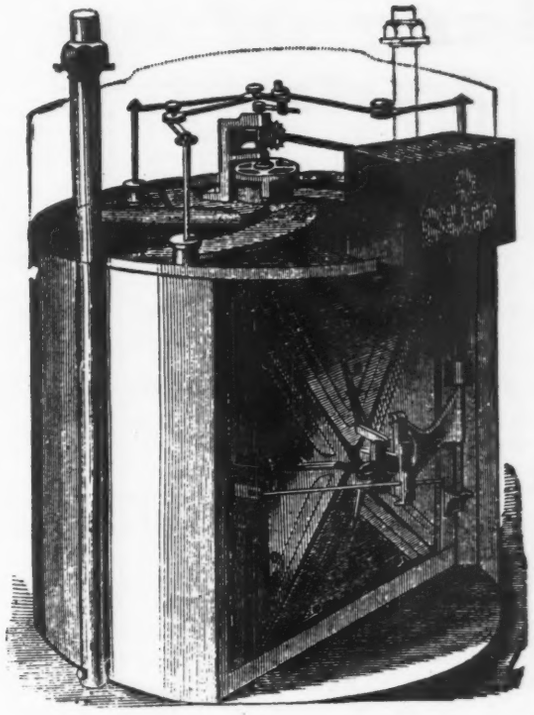
1859

AMERICAN GAS LIGHT JOURNAL makes its appearance on July 1 as the first publication to serve the gas industry and record its progress.

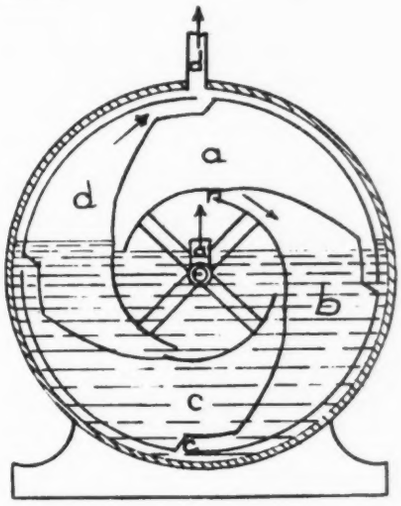
Meters: Search for a Better Cash Register

HARRIS & BROTHER'S
Improved Dry Gas-Meter,
Patented May 17th and 31st, 1859.
HARRIS & BROTHER,
MANUFACTURERS OF EVERY DESCRIPTION OF
GAS-METERS AND GAS-APPARATUS,
No. 1117 Cherry St., Philadelphia.

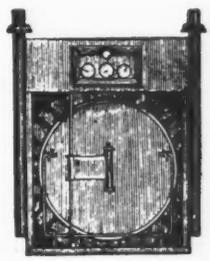
Advertisement in 1859 noted improvements in "dry meters."



Jones & Lenning dry-type meter in 1860 featured "rotary valve."

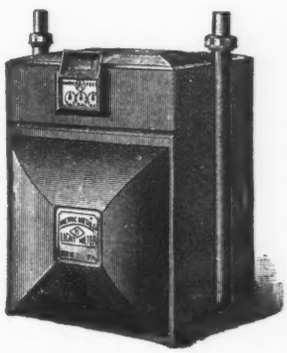


Samuel Clegg invented the first meter in 1815, a wet-type; water was used as a "seal."



Tin case meter of 1867 looks much like today's meters in exterior design.

First iron-case meter, made in 1888 by Metric Metal Works, was developed to measure natural gas.



In the 1890's, nearly all meters looked like this; case designs were fairly standard.

Pre-payment meter of 1894 used 5¢ pieces, gave customer 40 cu ft.

Diary of an Industry

By the time Colonel Drake brought in his famous well near Titusville, Pennsylvania, the new magazine was two months old.

At Fredonia, New York, a second gas well was drilled, to 150 ft, which increased production from 176 cu ft per day to 4500 cu ft per day.

P.H.&F.M. Roots Company was established to produce exhausters (blowers) for use in gas manufacturing.

The pressure governor (regulator) began to be incorporated in street lighting burner assemblies.

"Dixie" was composed by Dan Emmett. In 1861, the tune captivated a Confederate rally in New Orleans and spread to the South Armies.

Darwin published his work on "the origin of the species."

In the JOURNAL's first issue, a table of "Gas-Light Companies" listed 183 in the U. S., 5 in Canada. The editor noted that "an established company with 100 customers cannot fail to prosper." He also asked "why not use gas lights for railroad cars?" Mention was made that in Macon, Georgia, gas was being made from pine wood. First technical article — on clay retorts — appeared.

Second issue of the JOURNAL reported 237 gas light companies in the U. S., six in Canada, and one in Cuba. In the third issue (September), a "Gas Engineers' Column" appeared to discuss technical subjects.

By October, 1859, the JOURNAL was moving along quickly in its editorial program, instituting a "Patents Column" and publishing a detailed discussion on "Discharge of Gas from Pipes." Two unique events of the day were reported — a "gas light mail station" patented by Albert Potts, and an article on "Gas Lighting by Electricity," that discussed use of a platinum wire to ignite gas light burners and relight them when accidentally blown out. In the same issue a report from Louisville Gas Works discussed a method for coating wrought iron pipe — internally and externally — with a coal tar mixture.

The JOURNAL editor proposed, in October, that a "national gas light association" be founded. It took 13 years for the idea to jell, for not until September, 1872, was the forerunner of today's American Gas Association founded.

November, 1859, issue featured an extensive discussion on David Melville of Newport, Rhode Island, and his "gas apparatus" patented in 1813 . . . and evidence that he was the first man in the U. S. to use gas lights (in 1812). The same issue also reported a gas works under construction in Hawaii — at Honolulu — and that the Peoples Gas-Light Company had been organized and chartered in Chicago.

In December, the editor quoted a "pun" from an English publication on the high price of gas in the U. S., calling it "the **heavy** charge of the **light** brigade."

1860

First group of subscribers to the JOURNAL from Oregon and California arrive. They came by Pony Express from Sacramento to St. Joseph, Missouri, then by mail train to New York City.

First series of technical articles on the gas industry of 1860 — written by engineers of various New York City area companies — published in the JOURNAL.

Hot water stove introduced by Hunter-Keller & Company of New York.

Natural gas discovered at East Liverpool, Ohio and used for heating evaporating pans in salt plants. Natural gas also discovered in Kansas near Paola. Several wells drilled.

JOURNAL begins fortnightly publication in July, issued on 1st and 15th of each month.

Tornado destroyed new retort house of Philadelphia Gas Works at Point Breeze.

Pennsylvania Railroad began using gas to light one of its passenger cars.

Houston, Texas, announced plan to construct a "gas works."

Cincinnati reports 100 families cooking on "gas stoves."

Little Rock, Arkansas, gas works put into operation on July 31.

Gas works reported under construction in Los Angeles by Withered and Tiffany.

1861

"Telemetering and Remote Control" device featured in article in Jan. 1, 1861, issue of the JOURNAL. Device was developed in France, used "telegraphic agent" to indicate pressure at remote point, allowed "engineer" to make changes in pressure.

Samuel Clegg, noted gas engineer and inventor (meter, automatic pressure regulator, etc.) died on January 8, 1861, at Hampstead, England.

Civil War began on April 12 and 13; the JOURNAL reports on what happened at Fort Sumter, editorializes that it might be a "long and bloody" civil war.

Manhattan Gas Company and Cincinnati Gas Company report formation of "home guard" units to protect civilian populace.

Massachusetts Gas-Light Association formed on May 4, 1861.

Massachusetts passes law (April 10, 1861) establishing office of "Inspector of Gas Meters and of Illuminating Gas," to take effect on July 1, 1861.

Memphis, Tennessee, Gas Works "seized" by rebels.

"Improved valve" for dry-gas meter patented by Jos. A. Sabbaton, engineer.

First successful three-lift gas holder built in London.

First oil well in California drilled in Humboldt County.

Professor E. B. Andrews of Marietta College advanced the theory that crude oil is the product of distillation at low temperatures of bituminous strata, and that natural gas is a product of such distillation.

1862

Thomas Swinnerton (England) granted patent on process to make coal-gas by utilizing waste heat of blast furnaces in iron works.

Congress passes tax of 5 to 15 cents per Mcf on gas sold by gas companies, effective September 1, 1862. New York company proposes to pass tax to customers, is greeted by editorial blasts of New York City newspapers. Public pressure forces company to withdraw, pay tax itself.

Census report released in 1862 says there were 206 companies in United States in 1860, who produced 4-billion cu ft of gas, sold at value of $11-million. JOURNAL declares census statistics "useless," notes that its published records showed there were 381 companies in 1860; also notes that the 206 companies mentioned produced 5-billion cu ft valued at $13-million, but leakage accounted for losses of 1-billion cu ft.

Industry survey by the JOURNAL for the year 1862 reports 465 gas-light companies operating, with 420 in the U. S., 23 in Canada, 22 in Cuba, Mexico, and South America and New Zealand.

Natural gas discovered in California near the Mattole River, in the Lower Mattole Valley.

Professor T. S. C. Lowe reported making gas to inflate balloons that were used to make observations on Confederate batteries at Fair Oaks, Virginia.

Natural gas is used in the Kanawha Valley, West Virginia, as fuel for evaporating salt water from the same wells.

1863

First pipeline to transport oil is laid from Tarville to Plumer, Pennsylvania, distance of 2½-miles, using 2-in. pipe.

American Meter Company formed with Samuel Downs as president; firm was consolidation of Down & Merrifield; Code, Hopper & Company, and Robert H. Gratz & Company.

Lenoir invents the gas engine.

1864

Gas works in several Southern (Confederate) states reported using cottonseed to make gas as coal is practically unavailable.

Steamboat on Hudson River is lighted with gas; vessels took supply at Albany, stored the gas in tanks.

Eagle Gas Stove Works of New York City introduces a "gas stove." Device was little more than a gas hot plate.

Total of 60 patents relating to gas making are listed in the September 16 issue of the JOURNAL.

1865

April 17 issue of the JOURNAL bordered in black to note that Abraham Lincoln had died on April 14, having been shot in theatre by John Wilkes Booth.

Oil discovered in Illinois, flowing out of a newly-sunk coal mine shaft.

May 2 issue carries report that first oil well was drilled in 1848 at Cherry Run, Pennsylvania.

Law, an Englishman, patented the first pneumatic tool.

Samuel Van Syckel completed a 2-in. wrought iron pipeline from Pithole to Miller Farm, less than five miles away. Two pump stations moved 800 barrels of crude oil daily.

First company to engage in natural gas business was formed in Fredonia, New York, as the Fredonia Gas Light and Water Works Company.

Natural gas, from a well near McCoy's station, Pennsylvania, was first used for manufacturing lampblack.

1866

Cooking and heating apparatus discussed in the JOURNAL in October 2, issue.

November 2 issue carries articles on *"Electricity from Heat,"* is first recorded discussion on thermo-electricity in a gas industry publication.

First oil well in Texas is completed near Oil Spring, Nacogdoches County, on September 12.

1867

Vitreous coatings (porcelain) reported being used on various types of gas apparatus, is called a "new art."

"Portable Gas Light Machine" is introduced.

Dr. Musgrave's cooking stoves introduced.

In London, England, reports the JOURNAL, rats are found "gnawing holes" in gas pipes, causing leaks; to keep rats away, pipes are varnished or coated with a coal tar.

First successful oil well drilled in Asia. Oil struck at 118 feet at Makum near Margherita, India, and 350 gallons were collected.

Two significant appliances introduced in U. S. — the Etna combined gas stove and heater, and Dr. Musgrove's gas stove.

Otto and Langen exhibited their free-piston atmospheric engine at Paris in 1867. Later in 1878, Dr. Otto brought out his famous engine with the Beau de Rocheas cycle.

1868

Kokomo, Indiana, man discovers gas while boring well in his cellar. He "tubes" the well and uses the gas to light his house.

JOURNAL promotes first "Convention of Gas Engineers;" response is good, convention is slated for June 23, 1868, in Cincinnati, Ohio, but never held because, at last minute, many gas engineers in eastern cities state they cannot attend because it is not convenient. Attempt serves, however, as basis for later founding of a national gas association.

State of New York passes bill prohibiting gas companies from collecting rent on meters.

Gas main explodes at U. S. Capitol in Washington, D. C., "under the dome," no one injured, damage extensive but not serious.

Aerated flame burner with platinum mantle invented.

American engineer, J. B. Chichester, introduces gas to Mexico City after successfully converting long-idle and never-used gas plant to new process.

Sholes and Glidden patented a typewriter in the U. S.

1869

Patent issued for an "electro-heating" device.

First advertisement on "wooden pipes" appears in JOURNAL.

"Cambridge" gas stoves introduced.

"Improved street curb box" is patented.

Lawrence, Kansas, gas works goes into operation on Christmas Day, illuminating the city.

Flagler Brothers of Boston, Massachusetts, incorporated to manufacture tubular products; firm, later to become National Tube Company, was first to hydraulically test pipe to 300-350 psi as standard practice.

Transcontinental railway completed, May 10, when a golden spike was driven at Promontory, Utah, marking the junction of the Central Pacific and Union Pacific lines.

First "offshore" drilling rig is patented by Thos. F. Rowland.

George Machlet arrives in this country from Germany; he was later to perfect a greatly improved gas burner system using positive air pressure, known as the "Little giant melter."

1870

"Oil gas" process at Saratoga, New York, reported successful in operation, uses naphtha or "light oils" to produce improved grade of gas for lighting.

Emerson McMillin invents iron-oxide process for purifying manufactured gas. "Gas Machine" for railway cars is invented.

Editorial in the JOURNAL discusses "corrosion" of iron gas mains, terms it a serious problem, suggests corrective measures should be studied.

Mechanical joint for cast iron pipe patented by Clark and installed in lines of Elizabethtown (New Jersey) Consolidated Gas Company.

Natural gas line 25-miles long, constructed of white pine, having 8-in. ID and 12½-in. OD, was begun between West Bloomfield and Rochester, New York.

Erie, Pennsylvania, is lighted by natural gas, and Fort Scott, Kansas, contemplates doing likewise from a well making 10,800 cu ft per day.

Improved "wet type" gas meter patented by Trumbore, provided a means of keeping a constant fluid level in meter, thus assuring its "efficient functioning."

Stevens Institute, Hoboken, New Jersey, was established. It was later to supply the gas industry with many talented individuals.

Diary of an Industry

1871

Memphis, Tennessee, gas works reported using oil-gas process developed at Saratoga, New York. Oil gas mixed with coal gas on a 50-50 basis, and results called "very satisfactory."

Painesville, Ohio, discovers natural gas. Buffalo, New York, drills gas wells for city use.

Mills Landon Callender, editor and owner of the JOURNAL dies of fever contracted in Panama while enroute to San Francisco on trip to investigate status of gas industry in "the West."

Professor Henry Wurtz, noted chemist, assumes editorship of AMERICAN GAS-LIGHT JOURNAL in July.

"School for Gas Engineers" is proposed by new editor.

Hyde Park Gas Company in Chicago reported to have laid 3, 4, 6, and 8-in. wooden mains.

In October, the great Chicago fire raged for 27 hours, destroying 18,000 buildings over an area of more than 1688 acres. Peoples Gas Light & Coke Company's North Station was saved, although every other building to the north, south, and east had been destroyed.

1872

A 2-in., 5½-mile natural gas line of cast iron pipe was completed August 1 from a Newton well to Titusville, Pennsylvania; called first "high pressure" gas line; pressure in line depended on well pressure. Line delivered 4,000,000 cu ft of gas a day to 250 domestic and industrial customers.

Gas line completed April from West Bloomfield, New York, to Rochester. Great difficulty in maintaining adequate flow, due to faulty construction. Consumers complained that gas was not equal to manufactured gas as supplied by the Rochester Gas Company, and the latter company refused to use the natural gas piped to the city, thus wrecking the hopes of the Bloomfield Company.

The *Gas Light Association of the United States,* first national gas association to be formed in this country, was created at a meeting held in Cleveland in September of that year. Prof. Henry Wurtz, editor of the JOURNAL, was elected the first Secretary.

1873

Professor Thaddeus S. C. Lowe perfected his carburetted water gas set — the forerunner of far-reaching developments in the manufactured gas field.

Munzinger introduces an "electric gas governor and pressure regulator" that indicated pressure in mains and provided means for controlling it by raising or lowering pressure.

First meeting of the "Gas Light Association of the United States" was held October 15, 1873 in New York City. Charles Roome of Manhattan Gas Company was elected president of "national" gas association.

New "Gwynne-Harris" water-gas apparatus put into operation at Citizen's Gas Light Company of Brooklyn.

Natural gas is found at Iola, Kansas, and is used for illuminating purposes at neighboring sanitarium, which also investigates its possible medicinal value.

1874

First iron and steel firm to use natural gas used in puddling and heating furnaces was Rogers & Burchfield at Leechburg, Pennsylvania.

John West develops first (in U. S.) mechanical charging machine for horizontal retorts in coal gas plants.

Natural gas discovered at Mattoon, Illinois, at a well drilled for water.

American Gas Light Association name is adopted officially by the new national gas association at its second annual meeting in Brooklyn, October.

1875

In June, 1875, great activity in the Pittsburgh, Pennsylvania, district is reported in drilling for gas. An 8-mile line is actually proposed to supply gas to Pittsburgh.

Alexander Graham Bell invented the telephone and Narkus, an Austrian, developed an experimental model of the automobile.

California's first commercial oil well completed in Pico Canyon.

George Warren Dresser became editor of AMERICAN GAS-LIGHT JOURNAL in October.

Old salt well drilled in 1820, near Sciotoville, Ohio, reopened and used for gas by Scioto Firebrick Company. Well had produced petroleum and natural gas since 1820, but no one knew what to do with it.

1876

Gas well at Etna, near Pittsburgh, is almost abandoned because pressure dropped from 80 psi at the wellhead to 17 at the furnace. Apparently, no one had yet thought of using compressors on natural gas lines.

Nicholas A. Otto, a German, built the first practical 4-cycle gas engine.

A 17-mile, 6-in. line to carry natural gas is laid from Butler County to Etna, Pennsylvania, for Etna Iron Works (now Spang-Chalfant).

Connelly Iron Sponge & Governor Company established.

1877

Editorial mention of Professor T. S. C. Lowe's new water gas set appeared in June Issue. (Illustration appeared in July 3, 1876, issue, is the first to depict the Lowe Water Gas Set). Equipment was sold by S. A. Stevens & Company of Philadelphia and New York.

Retort Gas Stove Company introduces a stove constructed on a "new principle" — superheating the gas before it was mixed with air.

JOURNAL, in an editorial (August 17, 1877), advocates greater cooperation of gas companies and stove manufacturers to bring about greater use of gas as a fuel "to achieve economical and effective transportation of light and heat to every house within the reach of a gas main."

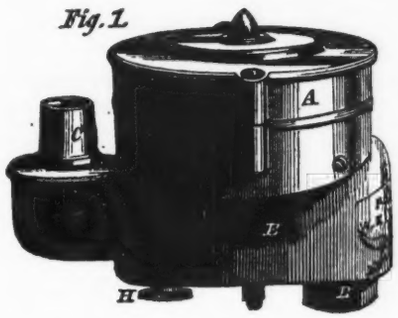
1878

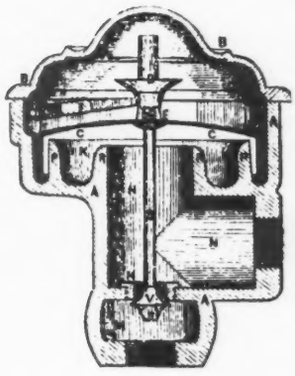
Use of natural gas as the ideal fuel is growing. Item in October issue says Harmony, Pennsylvania, runs practically the whole industry of the town with it. It is stated as a remarkable feature, that natural gas may be breathed just like air, without any ill effects, while manufactured gas is actually dangerous to inhale.

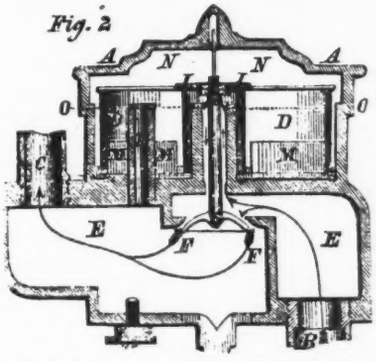
Thomas A. Edison patents his incandescent electric lamp. First commercial telephone exchange was opened in New Haven, Connecticut, on January 28, 1878. The first private exchange, used by physicians, was reported operating a year earlier (July 1877) at Hartford, Connecticut.

Kansas City, Missouri, expects soon to be lighted with natural gas from wells at Wyandotte, Kansas (November, 1878).

Regulators: Early Need for Even Pressure Met

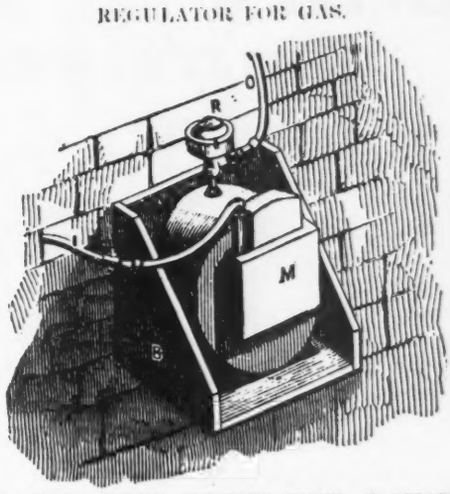






Kidder's gas regulator of 1860 (patented 1852) was first design to regulate flow of gas into meter.

REGULATOR FOR GAS.



IN THE ABOVE ILLUSTRATION, *R* SHOWS the position of the Regulator on the meter, M; *I* the inlet pipe to the meter from the Street main, and *O* the outlet pipe from the regulator to the burners.

This Regulator is constructed on a different plan from any other in use, inasmuch as the "lever" gives security and certainty to the motions of all the working parts, and is so sensitive that all objectionable friction and the liability to clog up and stick fast are entirely avoided.

This Regulator secures—

A usual saving of from 15 to 30 per cent. of gas.

Effectual prevention of all *blowing* of lights, even when only *one* is burning.

A steadier and brighter flame, less heat, *no escape* of unconsumed gas.

Address JOHN H. COOPER, Patentee and Sole Manufacturer,
419 North Seventh street, Philadelphia, Pa

City, Town, and State rights for sale.

Cooper's gas regulator of 1859 was popular early day design; cutaway views at left show its construction; advertisement at right, from 1859 issue of the JOURNAL shows how it was used.

THE STERLING GAS-REGULATOR

MANUFACTURED AND WARRANTED BY THE

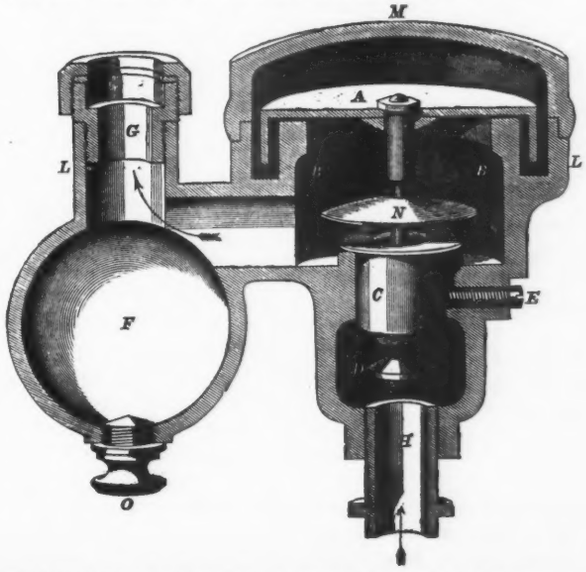
WHEELER & WILSON MANUFACTURING CO.

505 Broadway, New-York.

THIRTY PER CENT. SAVED IN GAS BILLS ! ! !

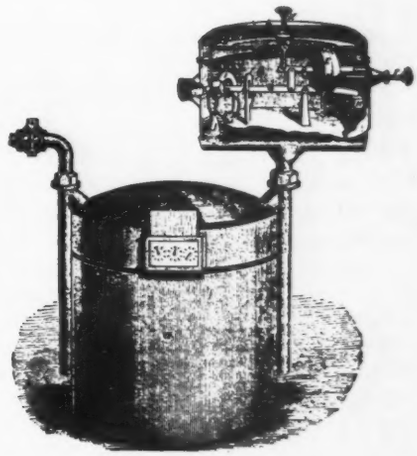
DESCRIPTION.

The Sterling Gas-Regulator consists of the case, L, L, enclosing the gasometer, A, the mercury cup, I, I, the gas chamber, B, the valve-seat, C, held in place by the set-screw, E, the hood, N, the valve, D, connected with the gasometer, A. M is the cover, H the coupling nearest the meter, G the coupling to the pipe for supplying the burners, F the drip for receiving the water, tar, and other impurities that may collect in the gas chamber, B, or the pipes, O the screw hole for removing these.



THE ONLY RELIABLE GAS-REGULATOR IN THE MARKET.

Sterling Gas Regulator of 1860, made by Wheeler & Wilson Manufacturing Company of New York, was featured in full page advertisement, reduced here for reproduction.



Beggs gas regulator of 1868 (above) was attached to meter, on outlet side. Use of regulators ahead of meter did not become common practice until about 1885.

Diary of an Industry

1879

W. Goodwin & Company, Philadelphia introduces the first gas range designed especially for hotel and restaurant purposes.

Miss M. S. Dodd gives series of free public lectures on the use of gas for cooking and demonstrates cooking techniques, introducing "home service" to the gas industry. (April 16, 1879).

South Shields Gas Company, an English company, gave an exhibition of over 300 appliances in which gas could be used for other purposes than lighting.

Brush patents his arc lamp. George Selden designed a successful 2-cycle internal combustion gasoline engine, applied for a U. S. patent.

First long distance oil pipeline began transporting crude oil from the Titusville area across the Allegheny Mountains to a railhead at Williamsport, Pennsylvania, more than a 100 miles away.

1880

First natural gas compressing station was put into operation by the Bradford Gas Company at Rixford, Pennsylvania. The plant had a duplex compressor driven by a 580-hp steam engine with a compressing capacity of 5,000,000 cu ft a day and a discharge pressure of 60 pounds.

Simple form of pressure regulator introduced in domestic lighting burners.

"Colonel" Edwin L. Drake died in Bethlehem, Pennsylvania November 8, at the age of 61.

A Mr. McDougall of Hornellsville (Hornell, New York) read what is probably the first paper on natural gas presented before a convention — that of Central New York Gas Engineers Association, held at Rochester, New York, February 19, 1880.

U. S. Government appoints JOURNAL Editor Dresser to conduct the first official census of the gas industry. (Work took considerable time and was published in the December 16, 1886 issue.)

1881

Natural gas discovered in December in Cincinnati, Ohio, causing a sensation in that city.

First association of electric light and power companies organized.

1882

First mention of the incandescent gas light made in the July 17 issue. This was not a Welsbach unit. Inventor was Mr. James Lewis, an Englishman.

First central electric generating station opened in New York — giving gas lighting its first real competition.

Panama Canal, begun by French, fails in early efforts.

United Gas Improvement Company, one of the first holding companies in the gas industry, is formed in Philadelphia.

1883

Chartier Valley Gas Company was formed by manufacturers to bring natural gas to their glass and steel plants in Pittsburgh; gas was piped in from Murrysville in Westmoreland County, Pennsylvania.

First Estate Gas Range built by the Estate Gas Stove Company of Hamilton, Ohio; appliance was cast iron, nickel-plated, and profusely decorated. Sheldon Gas Stove Company introduces a gas stove with water heating back, hooked up to a 40-gal. tank.

United States adopted standard time, Robert Louis Stevenson wrote "Treasure Island," and the Brooklyn Bridge was opened, May 24.

A 6,000,000 cu ft gas well brought in near Greensburg, Pennsylvania, for which the owners have been offered $20,000.

The Mt. Vernon (Ohio) Natural Gas Company was incorporated in December. Fredonia, New York, area was drilled again for gas with slight success.

Major Dresser, editor of the JOURNAL, died May 27, 1883. Joseph R. Thomas was named his successor.

Value of gas property in the U. S. is estimated at $200,000,000.

On October 16, 1883, an article of great importance appeared — discussing a display of gas appliances — including "Apparatus for the Measurement and Testing of Gas; Gas Engines; Gas Burners, Lamps, and Globes; Cooking, Boiling and Heating Stoves" by Consumers Gas Company at the Toronto Industrial Exhibition. Most interesting feature was an exhibit of cooking methods by a "young lady" who was both a first-class salesman and a first-class cook.

Device for indicating gas leakages developed by Herr C. von Thau described in May 2, 1883 issue of the JOURNAL.

1884

Chaplin-Fulton Company established.

Carl Auer von Welsbach patented the use of rare earths as material for incandescent mantles for gas lights — one of the gas industry's most significant developments.

Richards and Cross patented the "dry" type gas meter that, as far as basic principle is concerned, is almost unchanged in the meters used universally today for gas measurement to customers.

Gas is used for cooking in a major New York Hotel; Philadelphia adopts uniforms for some employees; and a station meter with capacity of 3,000,000 cu ft per day installed in plant of San Francisco Gas Light Company.

Waterman patented the fountain pen, Hollerith patented his punch card accounting machine, and Van Dopoel and Sorague developed the electric trolley car.

JOURNAL publishes the first comprehensive convention paper on Natural Gas, delivered by C. E. Hequembourg of Bradford, Pennsylvania, before the 12th annual meeting of the American Gas Light Association.

Natural gas near Wheeling, West Virginia reported to be used for glass manufacture.

Natural gas discovered in Frankfort, Dakota Territory, at a depth of 85 feet.

John C. Hastings, secretary and treasurer of the Washington, Pennsylvania Gas Light Company, reported data on prices to consumers in his territory. *Gas for an "ordinary family size cooking stove" costs $12 per annum for each stove, "hotels and extra large ranges, of course, costing somewhat more." Grates and heating stoves in private dwellings, "where supply is kept up the entire year," cost $8 per annum each. If the supply were required only part of the year, then a charge of $1 per month was made for the first stove and $0.75 for each additional one.* Hastings said that the inhabitants thought these prices entirely too high, and as a consequence, the Citizens Natural Gas Company was formed to drill wells and supply gas to the town.

George Westinghouse, having found gas on his property in Pittsburgh, organized the Philadelphia Company (and later the Equitable Gas Company as a subsidiary) to serve

Pittsburgh. Use of natural gas in Pittsburgh has increased so greatly that, according to a statement by Andrew Carnegie, one natural gas company alone had 335 miles of pipe within the city and was supplying 250,000,000 cu ft daily. He claimed that natural gas had supplanted 10,000 tons of coal a day.

By December, the price of natural gas at Pittsburgh had been reduced from $0.40 to $0.30 per Mcf, a further discount of $0.10 per Mcf being allowed for prompt payment. JOURNAL *comments that this ought to be cheap enough to satisfy anybody.*

Hot air house heating furnace designed by Professor T. S. C. Lowe used gas as fuel, was suspended from ceiling joists.

On November 11, 1884, the Consolidated Gas Company of New York was formed by merger of six existing (and often competing) gas light companies — the New York, Manhattan, Metropolitan, Municipal, Knickerbocker, and Harlem companies. It was then the biggest gas utility in the nation.

1885

Manufacturers Natural Gas Company organized in August in Pittsburgh. Later became Manufacturers Light and Heat Company (1889) by consolidation with two other companies in the area.

First "high pressure" manufactured gas transmission line installed under San Francisco Bay between Oakland and Alameda; line carried 10 psi.

First electric street railway in U. S. opened by Leo Daft in Baltimore, Maryland, August 10. Karl Benz built the first vehicle using an internal combustion engine. It was a three-wheeler. Gottlieb Daimler built an improved internal combustion engine.

Pittsburgh Commission on natural gas makes its report in November and decrees that "high pressure" gas should not be permitted within the city limits. Recommendations are made regarding the installation of governors, gages, and suitable pipes for distribution within the city. Over 500 miles of pipe had been laid in and about Pittsburgh to date, some as large as 24 inches. It was even whispered that certain interests are preparing to build a pipeline 200 miles long to bring gas to Cincinnati.

First mention made of the possibility of metering natural gas. Heretofore, it was contracted by the year because natural gas was thought to give false readings in meters of the day.

First suggestion of odorizing natural gas to assist in leak detection was made by Irving Butterworth of Columbus at the first meeting of the Ohio Gas Light Association.

Findlay, Ohio is booming as a result of having a supply of natural gas available. Gas "smells" because of its high sulfur content.

JOURNAL publishes in full the first really comprehensive paper on natural gas, delivered by Emerson McMillen before the eighth annual meeting of the Western Gas Association. Another paper on natural gas presented at the same meeting, by J. M. Critchlow, provokes great discussion as to the permanency of natural gas supply; *many noted experts claim that it could never be a serious menace to the manufactured gas industry.*

Natural gas is discovered in Canada, in a shallow well in Point-aux-Trembles township.

In December issue it is predicted that "within five years there will be some town in every state in the Union lighted by natural gas."

George D. Roper, Rockford, Illinois, designed his first gas range, known as the Eclipse.

First law passed in any state placing gas companies, and later electric companies, under state supervision was passed

by the Massachusetts legislature and approved by the governor June 11. Known as Charter 314 of the Acts of 1885 it provided for establishment of a board of gas commissioners that would have general supervision of all corporations engaged in the manufacture and sale of gas for light and for fuel. Act established the "franchise" system by requiring that in any city or town in which a gas company exists in active operation, no other gas company or any other person shall dig up and open the streets, lanes and highways of the city or town for the purpose of laying gas pipes therein without consent of the mayor and aldermen.

1886

May 17, 1886 — First important mention of the Welsbach mantle in the JOURNAL.

California Gas Light and Fuel Company incorporated in San Francisco on July 21.

JOURNAL publishes "Some Further Remarks on Natural Gas," by a Mr. Denniston, who warns the manufactured gas industry that they will have to reckon with natural gas in the future, whether they like it or not.

Drilling for gas at Homeward, Pennsylvania, reaches a depth of 6000 feet.

Indianapolis, Indiana, awards contract to drill for natural gas.

East Liverpool, Ohio, potteries again fired with natural gas piped from West Virginia.

Prepayment meter is introduced to the gas industry; device was first called an "automatic meter" and was invented by R. W. Brownhills of Birmingham, England.

Industry census (as of March 1, 1886) is published in December 16 issue of THE JOURNAL: report notes that there are 971 gas-light companies in the U. S. and 47 in Canada; average price of gas sold was $1.77 per Mcf; price range per Mcf was 75¢ to $20.00; a total of 186,901 public lamps were lit by gas; of 888 companies reporting specific information, 592 were serving coal gas, 296 were selling oil-gas, water gas, or other types of gas; industry's annual production was 23.5-billion cu ft.

Pacific Lighting Corporation organized on August 24.

Buffalo, New York, served with natural gas from 87½-mile pipeline from McKean County, Pennsylvania, fields.

1887

One of the early city ordinances governing the distribution of gas is cited in the June 16 issue of the JOURNAL. Common Council of the City of Troy, New York, specified that "main pipes shall be laid at such depth as directed by the board of health, not less than 3 feet from the surface, and shall be of the best iron pipe to withstand pressure of not less than 5 times the pressure under which the gas is to be delivered to consumers. And more significantly, *"No gas of any kind, whether used for illuminating or heating*

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purposes, shall be permitted in the City of Troy unless it be so charged with a strong odorant that its slightest escape may be easily detected."

Interstate Commerce Commission is established.

First attempt to weld steel into tubes made at Riverside Iron Works, Wheeling, West Virginia.

S. R. Dresser secures patent on use of rubber in pipe joints; patents a form of slip coupling.

First 24-in. OD, lap-welded, wrought iron pipe produced by Flagler Brothers.

American Gas Furnace Company incorporated

Daimler, a German, develops and patents a gasoline automobile.

Company formed by popular subscription to pipe natural gas to St. Louis, Missouri, from Edwardsville, Illinois, a distance of 30 miles. Pressure at the wells from which the supply is to be derived said to be 300 psi.

First Welsbach mantles given public display but not successful. Fifty-six burners were arranged in two rows along the center of the room and provided illumination perfectly steady and noiselessly. Mantle uses zirconia.

Statue of Liberty on Bedloe's Island, New York, Harbor, unveiled October 28, in presence of 1,000,000 people. Fund raised by New York World.

First gas refrigerators? Article in JOURNAL (April 16) described use of the Otto gas engine with a Lightfoot (compressor) refrigerator. *"Machines are made in several sizes to deliver from 2000 to 6000 cu ft of dry cold air per hour, but smaller and larger combinations can be made if required. A gas-driven refrigerator has been in operation for about two years in the vaults of Messrs. J. S. Fitter & Sons, Leadenhall Market, where it has given the greatest satisfaction."*

Welsbach Incandescent Light Company, a subsidiary of U.G.I., acquires U. S. patent rights to the Welsbach mantle. A factory was established at Gloucester, New Jersey, in 1890 to manufacture the incandescent mantles.

Proposed gas service to the City of Mormondom — Salt Lake City, Utah. Gas Company applied to the City Council for a grant of the sole franchise for the introduction and sale of natural gas in the city.

Dearborn Chemical Company established.

1888

First steel gasholder of large size designed and built for Consolidated Gas Company of New York by Continental Iron Works of Brooklyn.

Dunlop develops the pneumatic tire, Kodak camera produced by Eastman, and Tesla patents an induction motor in the U. S.

First iron case meter produced by Metric Metal Works.

Deep gas wells drilled in May 1888 disprove former theory that natural gas cannot be found below sea level.

Much alarm was registered by gas men over the decline of natural gas in the Ohio Valley.

In November, James M. Clark, presumably representing interests identified with Standard Oil Company, applied to the Council of Detroit for a franchise for distribution of natural gas or the right to make and supply artificial gas "should the supply of natural gas fail." Two pipelines would be laid to Detroit — a large and small one — one to be used in case of an accident to the other.

Some miles away, Philadelphia Company at Pittsburgh, Pennsylvania, placed all its natural gas service on meters.

Metric Metal Company organized at Beaver Falls, Pennsylvania; made first natural gas meter—of cast iron and brass—able to withstand pressures up to 30 psi.

1889

First automatic gas water heater manufactured by Fuel Gas and Electric Engineering Company, developed by Mr. Edwin Ruud.

Lowe perfects the three-shell or "improved double superheater" type of water gas set.

Equitable Gas Company of Pittsburgh built a 21½-mile, 36-in. line to transport natural gas. The 36-in. pipe was fabricated from ¼-in. steel plate, riveted together, and calked to prevent leakage.

Detroit served with natural gas brought in by 92-mile pipeline from fields in Ohio near Findlay.

1890

Charles Harrison writing in February on the "Financial Aspect of Natural Gas" noted that "All natural gas stocks are speculative" and "have never risen to the dignity of legitimate investments, and there is no prospect that they ever will." *What an opportunity he missed!* He also said that "with constantly and inevitably increasing cost of production and no opportunity for a corresponding cost to the consumer, what is to prevent ultimate bankruptcy of every natural gas company?"

Sherman anti-trust law passed. Idaho and Wyoming enter Union. Bundy patent the first successful time recorder.

Jewell circulating hot water heater introduced.

1891

First natural gas pipeline to Chicago was built by Indiana Natural Gas and Oil Company from Greentown, Indiana. It was 120 miles long, consisted of two 8-in. lines, using wrought iron pipe with screwed couplings. Gas was transported solely by well pressure, with initial pressure on the line of 525 psi. Before being put into operation, line was tested to 600 psi for 3 days, only 5 psi loss was observed. Cost of this gas in Chicago was reported to be 50¢ per Mcf . . . considerably lower than for manufactured gas. It was not considered good enough for illuminating purposes, however, and was used principally as a "fuel gas." Within a few years, pressure of the Indiana gas wells declined appreciably and the line was ultimately abandoned.

Dwar develops oil-cracking process.

Successful Welsbach mantle is marketed.

By January, 1891, it had been established that natural gas would be sold on a metered basis and that the day of unlimited gas at a flat rate was over, forever.

In February, the Pitot tube was advocated for natural gas measurement.

1892

Although oil had been discovered in Colorado 30 years previous, production and use of natural gas began this year, when the Florence Oil & Refining Company supplied several homes in Florence with the gas output of one of its wells.

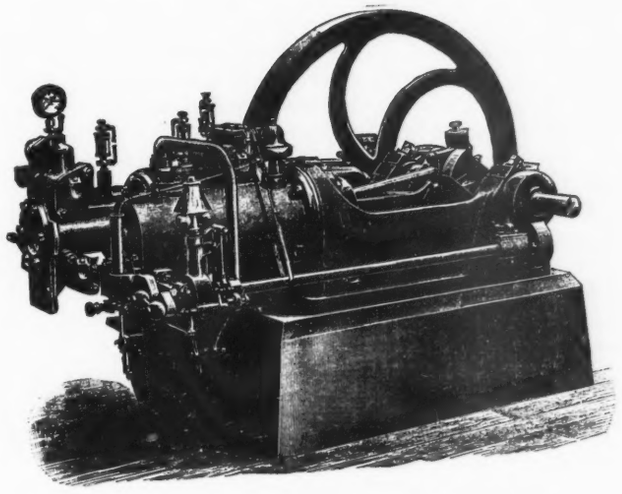
C. E. Duryea developed his gasoline automobile in 1892-1893 in U. S.

Dr. Rudolf Diesel patented internal combustion engine operating with pulverized fuel and air compression in 1892. Built first successful engine in 1895.

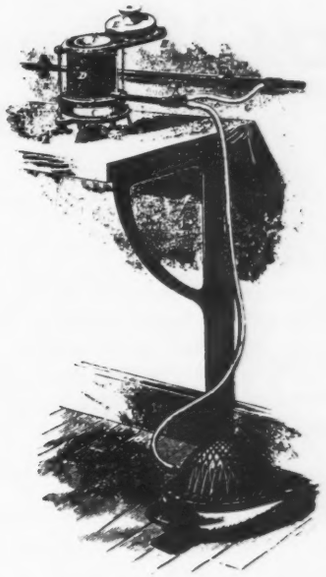
Reynolds Gas Regulator Company formed.

Tobey meter introduced—was a 3-diaphragm meter using a 3-port valve seat, could be adjusted by changing gear wheels in back of index.

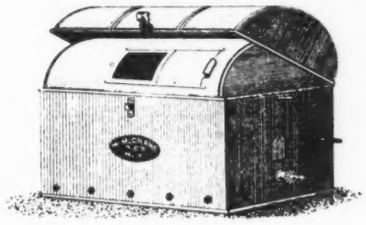
Business, Industry Found Many Uses for Gas



Otto Gas engine (1887) was used in combination with compressor to produce refrigeration.

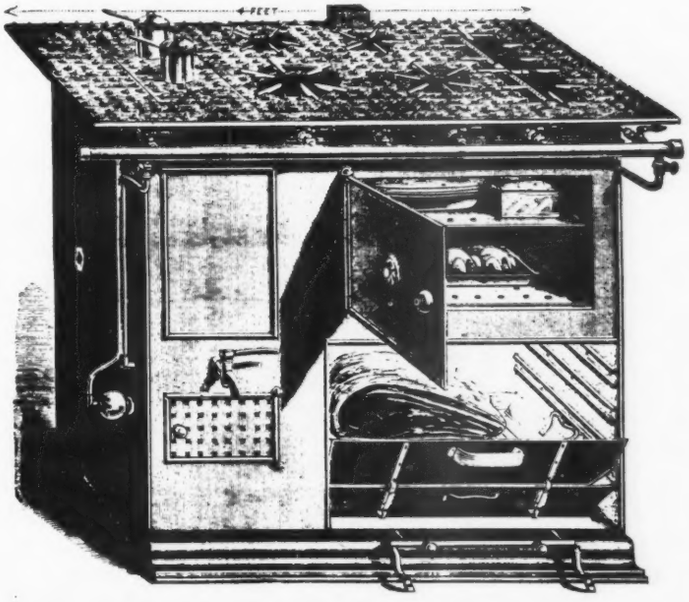


"Little Giant" melting furnace of 1899 used Machlet's positive pressure air system.

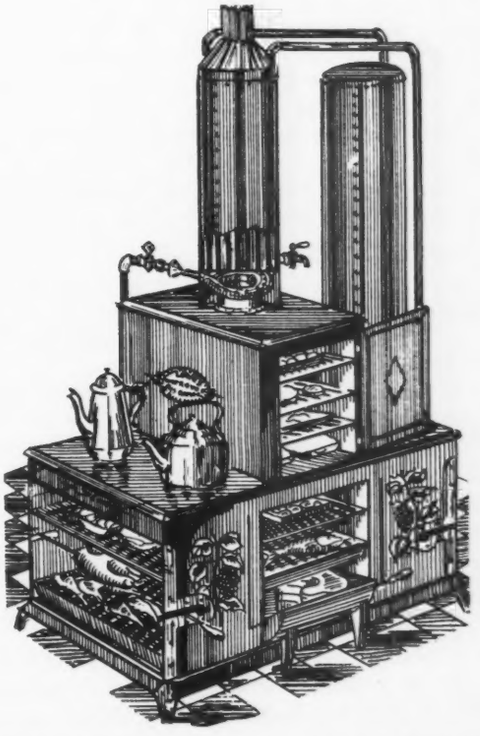


Vulcan gas-fired coffee roaster (1892) marked early commercial use of gas.

Economic Gas Soldering Iron (1887) mixed air and gas in handle, heated two soldering tips, one at a time.



First "hotel range" was produced in 1879 by W. Goodwin & Company of Philadelphia.



Hotel range designed (1884) by Prof. T. S. C. Lowe used flue gases to heat water.

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1893

"Largest gas well in the world," the Swagler No. 1, is brought in November 12 miles east of Washington, Pennsylvania. Its roar was heard for 15 miles.

First "house regulator" patented.

World's Fair (Columbian Exposition) held in Chicago.

1894

Several unsuccessful attempts were made to find oil and gas near Philadelphia.

Article on corrosion appears in JOURNAL, discusses possibility of electrolysis caused by electric street railways.

Article describing in detail the Welsbach mantle appears in November, predicts it will find widespread use by gas industry.

1895

Feb. 25, 1895 — Letter to the editor describes use of the Welsbach mantle, says its efficiency might cause great loss of load to the gas companies if it is universally adopted.

1896

Joseph Deveeks of the U.S.G.S. reports that the total value of the natural gas consumed in the United States in 1895 was $13,006,750 as compared with a value of $13,954,400 in 1894 and $14,346,250 in 1893. It is significant to note that the natural gas consumed in Texas was $50 in 1893, $50 in 1894, and $20 in 1895. The values of natural gas consumed from 1882 to 1895 show a rise from $215,000 to $13,006,650, with 1888 as the banner year, when $22,629,875 worth was used.

Enamels for coating pipe introduced in U. S. by the Wailes Hermiston Company of England.

William Kane demonstrates first boiler for generating steam using gas as a fuel.

First wireless patent granted to Marconi on June 2 by Britain.

State Geologist Blatchley of Indiana reports in June that one-half of the natural gas in the state has been exhausted.

1897

First commercial oil production in Oklahoma found near Bartlesville.

First 30-in. OD, lap-welded, wrought iron pipe produced by Flagler Brothers.

In June, William C. Clark was granted a patent for an instantaneous gas water heater.

Gas steam radiator invented by Robert Calef, of Massachusetts. His patents later purchased (1902) by James B. Clow and Sons.

August issue carries an article by John Kempf, Jr., regarding the "conversion" or changeover from manufactured gas to natural gas in Salt Lake City, Utah.

Ruud Manufacturing Company was incorporated.

First inverted incandescent burner produced.

U. G. I. leases Philadelphia Gas Works from City of Philadelphia for 30 years.

Goodman "gas stopper" introduced to gas industry.

Buckeye develops wheel-type trencher.

1898

An advertisement by William M. Crane Company of New York listed 34 different "up-to-date" gas using appliances they manufacture and have for sale. They were: gas heating stove, gas fires, gas radiators, gas logs, gas candy stoves, gas griddles, gas furnaces, gas irons, gas signs, gas water heaters, gas kilns, gas laundry stoves, gas ovens, gas plate warmers, gas oyster stewers, gas controllers, gas broilers, gas ranges, gas soldering stoves, gas steam tables, gas crematories, bray burners, gas burners, gas tips, gas self lighting burners, by-passes, gas fittings, meter cocks, service cocks, wax tapers, goose necks, sockets, etc., tubing, and iron castings.

War with Spain: *"Remember the Maine"* is popular slogan. Greater New York, city of five boroughs, established January 1. First diesel engine was built in the United States.

M. B. Skinner Company patented a pipe clamp.

Ingersoll-Sergeant piston-inlet air compressor adapted to compressing natural gas near Fostoria, Ohio.

1899

Robertshaw Thermostat Company founded.

First seamless steel pipe made experimentally in Philadelphia; 20-in. ID, with ⅝-in. wall thickness, in 6-ft lengths.

William Crane introduced special gas-fired "heater" for flat irons. "Gas iron" was not yet known.

C. E. Hequembourg patented natural gas dehydration method, using absorption method, by passing gas over or through anhydrous materials that would absorb water vapors.

Prof. Bunsen dies; was inventor of non-luminous, smokeless burner.

Pintsch gas reported used in 85,000 railroad cars, 4000 locomotives.

1900

At the turn of the century, natural gas had been discovered in 17 states and Pennsylvania was the leading producing state. Production was valued at over $23,700,000.

In this year, a total of 4192 passenger cars were built, the first automobile show was held in New York City in November, Packard built the first automobile with a steering wheel instead of a tiller, and the gas industry had yet to utilize the "horseless carriage" (at least nobody admitted to doing so up to this time).

In New Orleans, a gas main was laid under the Mississippi River, using a new technique of "pulling" the pipe across the river in sections. The crossing was 2100 ft long, and went as deep as 120 ft. Some years later one of the worst floods on "old Muddy" washed out the crossing and it was abandoned.

1901

First commercial natural gas field in Arkansas was discovered near Mansfield, in Sebastian County.

The famous Spindletop field near Beaumont, Texas, gushered in on January 10, opening up the rich Gulf Coast area to development. The field, first discovered on a salt dome, was also the first discovery well to be drilled with rotary tools.

The oxy-acetylene welding process was invented and used for the first time in France.

In New York City there were over 61,000 public lamps in operation. Over half of them were open flame type. Only 8000 mantle type lamps, introduced in 1896, were in operation. The open flame types produced 12 candlepower, used 3 cu ft of gas per hour; the mantle type produced 60 candlepower, used only 3½ cu ft per hour.

1902

Aurora (Illinois) Gas Light Company laid the first high pressure manufactured gas transmission main, 8 miles of 4-in. steel pipe to serve Batavia. The line operated at 40 psi.

First portable air compressor was introduced, a horizontal unit driven by an "oil engine."

American Stove Company was founded.

1903

Ohio Gas Light Association meeting of 1903 was very productive — the group appointed a committee to study the possibility of "uniformity of gas meters" in an early effort to standardize meter sizes and also appointed Henry L. Doherty head of another committee on "standard methods of testing fuel gas appliances." The latter group's undertaking was the beginning of recognition of the need for a testing laboratory.

In California, nine gas wells were drilled in the Ventura field some 50 miles northwest of Los Angeles, and natural gas was piped to Ventura.

1904

Experiments on central house heating, using gas as a fuel, were begun in St. Louis by Laclede Gas Light Company.

A new-style tin-case meter was developed that could measure up to 156 cu ft per hour with only a ½-in. pressure loss.

Kansas Natural Gas Company was organized by a number of gas producers, the first important natural gas transportation firm in the Midcontinent area. The new firm built three 16-in. lines in eastern Kansas from gas fields in Allen, Neosho, and Wilson counties to serve Kansas City, Joplin, and local communities.

1905

In this year there were 2139 natural gas producing companies operating in the U. S. From the gas fields of eastern Kansas, Midcontinent area development moved southwest when a wildcatter discovered the famous Glenn Pool field in northeastern Oklahoma. In Louisiana, the Caddo field was discovered, marking the beginning of natural gas production in that state.

First use of lead wool for cast iron pipe joints was reported this year.

The first automobile "installment buying plan" was put into operation.

In St. Louis, Laclede Gas Light Company reported it was using a portable air compressor for testing both high and low pressure mains.

Boston Consolidated Gas Company was formed on June 15 by a consolidation of eight gas companies in the greater Boston area.

Pacific Gas and Electric Company was organized on October 10, a merger of the California Gas and Electric Corporation and the San Francisco Gas and Electric Company.

Bredel produced the first twin generator-recuperator design for horizontal retorts in gas works.

1906

San Francisco's earthquake and fire, April 18 and 19, left 452 dead and losses totalling $350,000,000. Reconstruction of gas mains and plants was begun immediately. The JOURNAL, commenting a short time later, noted "it is pleasing to learn that San Francisco is again partially served with gas." Service was restored in many areas within 30 days, almost completely in two months.

In Louisiana, the legislature passed an act making it a criminal offense to allow a gas well to remain out of control, or to burn or flow into the air wastefully the natural gas from any well. The act authorized the state board of engineers, at the order of the Governor, to take over any neglected wild well.

Columbia Corporation (predecessor of Columbia Gas System) was incorporated in West Virginia on September 11. In the same year, Oklahoma Natural Gas Company was formed.

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On February 20, a group of 21 natural gas men met in Kansas City to organize the Natural Gas Association of America.

Largest gasholder in the world — capacity of 15,000,000 cu ft — was under construction at Astoria, Long Island, for Consolidated Gas Company of New York. World's largest gas mains — 72-in. diameter — were also underway from the Astoria plant.

Boston Consolidated Gas Company established an employee profit-sharing plan, first of its kind reported in the gas industry. Everyone but the company president was eligible to participate.

1907

Flow meters used to measure quantities of air and steam delivered to gas making sets, were introduced, representing the first real improvement in accurate measurement for more efficient operation of gas making plants.

Louisiana's natural gas fortunes were boosted with the discovery of the Monroe field. Texas also beamed over discovery of the Petrolia field.

Asbestos felt wrappers for pipe were applied for the first time as a protective measure for coatings used to combat corrosion.

Natural gas was discovered to be a source of helium, as Cady and McFarland found the rare element in production near Dexter, Kansas.

In California, the Santa Maria Gas Company became the first utility company in that state to provide natural gas domestic service.

In just 50 years since its first actual introduction (by Prof. Sanders in 1858, at Philadelphia), the process of making water gas had finally passed the coal gas process in popularity. In 1907, there were 520 gas works using the water gas process, and their annual output was over 100-billion cu ft. Coal gas was used by 510 gas works, which had a total capacity of only 58-billion cu ft.

Southern California Gas Company organized.

1908

First use of the automobile by gas utilities was reported from opposite ends of the nation. In Los Angeles, the L. A. Gas and Electric Company emergency crew had at its disposal a 30-hp "Rambler Touring Car," equipped with tools and a hardy crew to meet any and all emergencies. In New York City, Consolidated Gas Company outfitted its emergency crew with a 35-hp automobile, similarly equipped.

Henry Ford began mass production of the low-priced Model "T," which later came into use at many gas companies for all types of work.

Brooklyn Union Gas Company, aggressively pushing gas for cooking purposes in the home, established a Home Service Department.

In Atlanta, Georgia, in May of 1908, the Southern Gas Association was organized.

The Canadian Gas Association held its first annual meeting in May. In December, the Pennsylvania Gas Association was founded.

In June, an article described how gas was used to heat a swimming pool.

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1909

Cincinnati Gas Transportation Company put into operation a 183-mile 20-in. natural gas line from fields in West Virginia to Cincinnati, where citizens hailed the arrival of the new fuel in July.

Bryant Heater and Manufacturing Company built the first cast iron sectional gas boiler at its plant in Cleveland.

Lone Star Gas Company began construction of a 16-in. line from Petrolia field to Fort Worth and Dallas, a distance of 135 miles, the first long-distance natural gas line in the Southwest.

West Virginia gained first place in production among natural gas producing states, a position it held for 14 years.

Ironcase "A" meter introduced.

1910

The U. S. Bureau of Mines was organized and, through its efforts, engineering knowledge regarding natural gas and oil began to be widely disseminated.

The first liquefied petroleum gas was produced at the Sisterville, West Virginia, plant of the Riverside Oil Company. A. N. Kerr, then general superintendent of the company, pioneered the development of the new industry.

1911

First practical application of welding of pipe joints by the oxy-acetylene method was made on a 1-mile main laid by the Philadelphia & Suburban Gas Company, introducing this new technique of construction to the gas industry.

First practical orifice meter design was developed by J. G. Pew and H. C. Cooper and was first used to measure large volumes of natural gas on an installation in West Virginia. The device was evolved from the pitot tube.

The Supreme Court dissolved Standard Oil Company into 34 competing companies, breaking up the world's biggest oil monopoly.

The Weymouth flow formula was introduced to the gas industry as the first formula to permit accurate calculation of gas flow in high pressure natural gas lines.

Natural gas, piped from Oklahoma and Kansas fields, was selling to consumers in Kansas City at 25¢ per Mcf.

JOURNAL articles covered many timely subjects — the use of gas in fire engine houses to keep up steam in fire engine boilers at all times; a discussion on a method of protecting pipe by coating and wrapping it before installation under street railway tracks; use of portable air compressors; an article on "time studies" of distribution construction and suggestions on how to improve worker efficiency, and descriptions of available automobiles.

Southern Counties Gas Company organized

1912

Bureau of Standards published in April the first edition of its famous *Circular 32 — "State and Municipal Regulations for the Quality, Distribution, and Testing of Illuminating Gas."* The circular, which became known throughout the industry as merely "Circular 32," helped establish standards for a heating value standard for gas — manufactured and natural — replacing the old "candlepower" standards.

The JOURNAL noted the observance of the "centenary of gas as an illuminant" and published a history of the gas industry with particular reference to lighting.

The 1912 issue of Brown's Directory, then published by AMERICAN GAS LIGHT JOURNAL, noted that there were 2090 gas companies in the U. S., with 1102 serving artificial gas, 547 serving natural gas, 206 serving acetylene gas, 119 serving "gasoline gas," and there were 116 "parent" or holding companies in existence.

1913

Los Angeles received its first natural gas on April 28 from a 120-mile, 12-in. pipeline from Buena Vista Hills, California, built over the Tehachapi Mountains to the City of Angels. The gas was mixed with manufactured gas before being put into the mains.

On February 25, the Federal Income Tax was introduced as a *"temporary measure."*

Natural gas was discovered in Dawson county, Montana; in New Mexico, the first production of oil was reported.

Oklahoma State Legislature passed law providing for ratable production from a common reservoir of natural gas. This act, it is believed, was the first oil or gas field conservation measure of this type to be enacted by any state.

1914

"High-pressure" gas lighting burners were featured at the San Francisco Exposition of 1914. Little-discussed but important feature (to the gas industry) of the piping system installed at the Exposition was fact that all joints on the gas main were welded, using oxy-acetylene welding method. Oxy-acetylene welding was also reported used on construction of a 35-mile gas pipeline near Enid, Oklahoma.

1915

The "Red Wheel Lorain Oven Regulator," developed in 1913 by an engineer of American Stove Company, introduced "time and temperature" cooking method to the gas industry and consumers; first range so equipped was shipped in December, 1914; the JOURNAL termed it the most outstanding improvement in gas ranges made up to that time.

The clock and timing pendulum, invented and patented by Taussig of U.G.I., was combined with hydraulic control of valves, introducing "automatic control" gas making plants.

By 1915, many gas companies had given up on the lighting load, and proceeded to develop the uses for gas for cooking, water heating, space heating, and — to a limited extent — industrial uses such as heat treating.

First report on the "gas refrigerator" appeared in the June 28 issue of the JOURNAL.

"Standard" specifications for gas ranges were prepared by the National Commercial Gas Association.

California established a Department of Petroleum and Gas in its State Mining Bureau, giving widespread recognition to the importance of geology and engineering in the scientific production of oil and gas.

An article by J. D. Shattuck discussed welding of high pressure mains, high pressure distribution system design and construction, use of pipe benders, use of trenching machines, and other heretofore undiscussed subjects. Article was, possibly, first comprehensive coverage of the "modern" distribution construction practices evolved during this period.

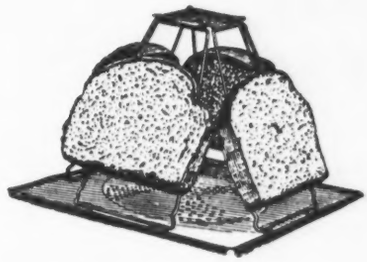
First successful underground storage of natural gas made at Welland, Ontario, Canada.

1916

Underground storage of natural gas in depleted or near-depleted fields was first practiced in the Zoar field near Concord, New York. The stored gas was piped 30 miles north to Buffalo.

Home Appliances: Hot Water and "Hot" Ideas

Vulcan gas toaster was introduced in 1892.



G. Gefrorer of Philadelphia offered nursery heaters in 1866.

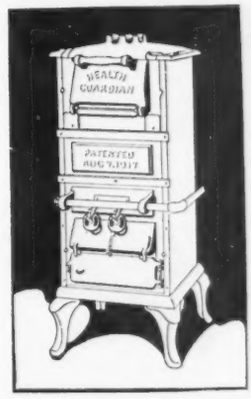
Consump'n 6 ft.

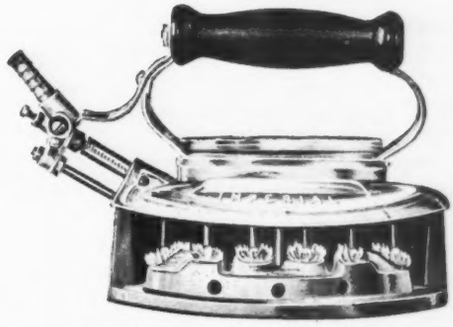
Nursery Heater

Consump'n 2 ft.

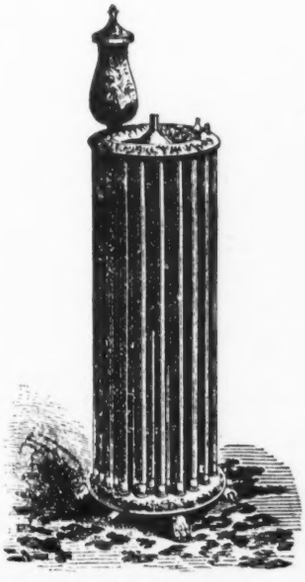
Reliable Gas Range and Water Heater of 1894 was made by Schneider & Trenkamp of Cleveland.

Odorless incinerator came in 1920.

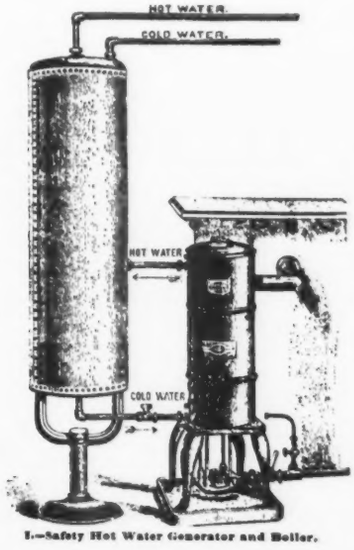




Gas iron was popular in 1900's. Imperial model shown here was 1920 version.

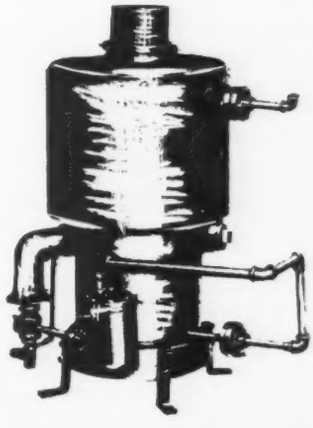


Hunter-Keller "Hot Water Stove" of 1860.

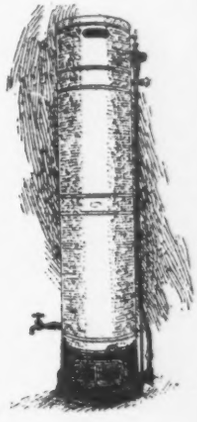


1.—Safety Hot Water Generator and Boiler.

Sheldon introduced this water heater in 1883.



First automatic water heater by Pittsburgh in 1895.



First Ruud automatic water heater.

Diary of an Industry

Consolidated Gas of Baltimore undertook on a large scale the development of gas heating on its lines, introduced a special secondary step rate of 35¢ per Mcf for large volume gas users.

Use of porcelain enamel on gas appliances made its appearance, adding greatly to their appearance.

General Gas Light Company introduced the "Radiant-fire" gas heater.

Sven Nordstrom patented the lubricated plug valve.

In Louisiana, the rich Monroe gas field was discovered. Proved area later estimated to cover approximately 260,000 acres.

Inhibitive-type grease coatings for pipe were developed. First application to gas lines was made in 1918.

Motor trucks came into widespread use as rapid increases in urban populations, especially in outlying districts, made it necessary to extend gas lines. By 1916, autos and trucks were used to deliver pipe, meters, appliances (such as stoves, heaters, and mantles for gas lights), and for transportation of workmen and inspectors.

Capital invested in the gas industry in 1916, reported the JOURNAL, was approximately $1.1-billion, and annual output was 190-billion cu ft, supplying a total population of 32,-000,000 people with gas service. Approximately 70 percent of all gas being manufactured was made in Lowe water gas apparatus or some modification of the process. The remaining 30 percent was coal or oil gas.

1917

The U. S. entered World War I on April 6.

In Massachusetts, the Webster & Southbridge Gas & Electric Company reported it installed 11 miles of 3-in. pipe "by modern methods," using a small gasoline-engine powered trench digger, a modern-type pipe layer, a trench back-filler, tampers to compress the backfill, and an electric welder to weld together the miles of pipe required.

West Virginia continued to lead all states in the Union in production of natural gas, reported the U. S. Geological Survey for 1916.

New York City boasted of the first gas heated battleship — the first and only warship to be heated by gas. Consolidated Gas installed 43 pressed steel gas radiators to do the job, and as a finishing touch, cooked Thanksgiving Day dinner (on gas ranges, naturally) for 500 Navy recruits.

AMERICAN GAS LIGHT JOURNAL changes named to *American Gas Engineering Journal,* evidencing importance of engineering and technology to rapidly growing gas industry.

1918

American Gas Association was organized in June of this year in New York City, a consolidation of the American Gas Institute and the National Commercial Gas Association.

Commercial production of helium was begun at Fort Worth under the direction of George A. Burrell and Richard B. Moore.

In the northern part of Potter County, Texas, natural gas was discovered in what later became the renowned Panhandle gas field, world's largest producing gas reserve, composed of almost 1,600,000 acres.

World War I came to an end on November 11.

1919

First large-scale underground gas storage field developed in Kentucky — the Menifee field — by Central Kentucky Natural Gas Company.

Hugoton gas field in southwestern Kansas was discovered in December. The first deep well in this field was started this year and was completed as a gas well three years later at 2755 ft. Hugoton was to become the world's largest dry gas field, enclosing an estimated 3,850,000 acres in Kansas, Texas, and Oklahoma.

The "simplex" prepared joint for cast iron pipe was developed this year by American Cast Iron Pipe Company.

Consolidated Gas Company of New York reported a record sendout for any gas company in the world — 160,-327,000 cu ft in one day — during zero weather.

"Largest gas well in the world" (at that time) reported brought in 25 miles north of Amarillo in Potter County, Texas. Expert test reports flow of 71,000,000 cu ft per day, uncapped, and over 100,000,000 cu ft per day when capped.

In Pittsburgh, the Bureau of Mines opened its new $1-million laboratories, designed to conduct fuel investigations of all types.

Zander Refrigerator Company of Chicago issued a booklet on "Modern Refrigeration," by John Zander, which discussed an automatic absorption refrigeration machine operated by either gas or electricity. Zander, who was with Peoples Gas Light & Coke Company in Chicago, noted that the device was invented more than 60 years previously by Ferdinand Carre of France, but practically no progress had been made until Zander introduced a vital improvement — an automatically controlled means for supplying heat to the bottom of the generator and an automatically controlled means of supplying cooling water to either the condenser or the generator. Despite Zander's efforts — and those of other men before and after him — the gas-fired refrigerator didn't get much gas industry support for a long time.

With prohibition seemingly "inevitable" (it came in 1920) the JOURNAL reported on the use of gas in the manufacture of beverages of the "beer" type and devoted considerable space to recipes that would likely receive much attention in future years. *The editor in 1919 was certainly a thoughtful man.*

1920

Ute Oil Company erected plant at Debeque, Colorado, for shale oil extraction. Process developed by G. W. Wallace, superintendent of St. Clair County Gas & Electric Company of Illinois.

Odorless Incinerator Company, Philadelphia, demonstrated new "garbage disposer"; device, lined with firebrick, had positive draft up flue, used temperature of 1800 F. Positively odorless.

Combination meter-regulator introduced by Equitable Meter Company.

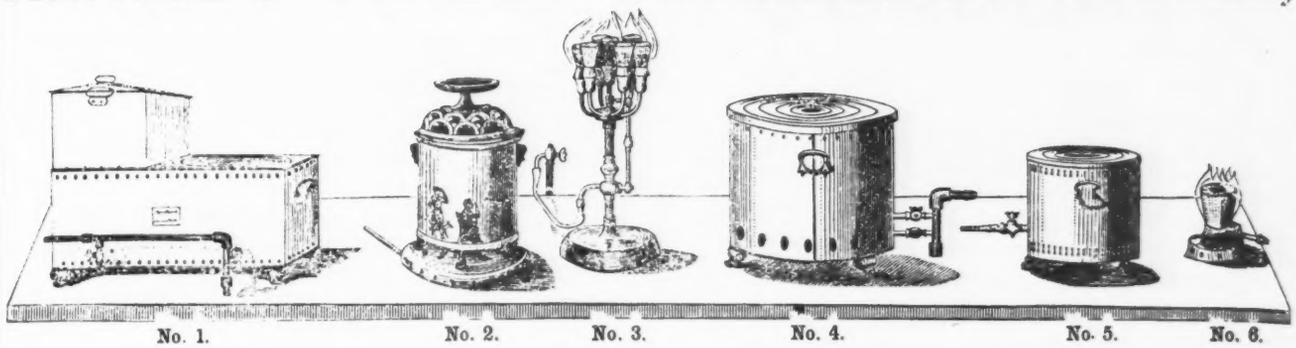
Vertical casting process for cast iron pipe announced by Cast Iron Pipe Bureau.

Natural gas successfully used for drilling near Three Rivers, Texas.

Home Appliances: "Cooking with Gas"

212 THE AMERICAN GAS-LIGHT JOURNAL.--APRIL 2, 1860.

KRAUSE'S PATENT GAS-BURNING STOVES,



No. 1. No. 2. No. 3. No. 4. No. 5. No. 6.

First advertisement in JOURNAL on gas stoves is reproduced above.

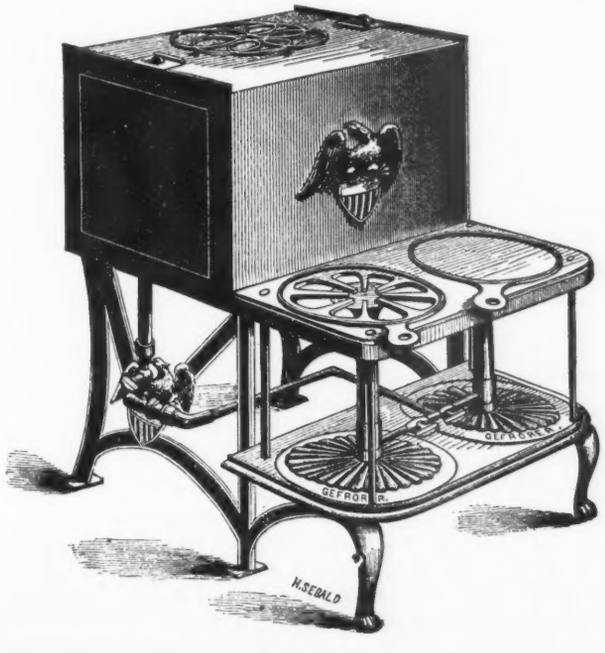
At right is Retort Stove of 1880 that featured enclosed oven, broiler.

III.—Improved Hot Plate, No. 108.

Gas hot plate was popular in 1886.

Gejrorer's cook stove of 1866 (below, left) featured 15 by 19-in. oven, used 30 cu ft per hour.

Goodwin "Sundial" gas stove (below, right) was fancy model in 1886.



II.—Gas Cooking Stove No. 8 B.

Diary of an Industry

City of Omaha, Nebraska, takes over city's gas company. Plant makes gas from corncobs, said to be good after purification.

Gas lighting load begins slipping, went from 21% to 15% by 1925.

1921

JOURNAL name shortened to *American Gas Journal*, scope of editorial coverage broadened to include merchandising.

Survey completed by American Gas Association revealed that gas furnishes the cooking, heat and in many cases illumination in the homes of over 49,000,000 citizens. Communities served with gas number 4,600 and meters 8,580,000, the gas mains totaling 68,300 miles. There are now 7,000,000 gas burning cooking appliances in American homes, gas water heaters number approximately 1,500,000 and gas heaters nearly 1,000,000. Approximately 25 percent of gas consumed is for industrial purposes. More than 1000 artificial gas companies supply gas to 4600 cities, towns and villages. More than 300,000,000,000 cu ft of gas is distributed annually.

First commercial production of steel pipe having electrically welded seams.

First exploration reflection seismograph experiments conducted in Oklahoma.

Editorial in November JOURNAL notes that "therm" has been applied to heat content of gas distributed in England but that "we know of no place in the U. S. that could use this method under present conditions."

Iowa District Gas Association, in conjunction with the engineering extension department of the Iowa State College, at Ames, Iowa, conducted the first short course for gas metermen.

1922

Program of cooperation was initiated between U. S. Bureau of Mines and the natural gas industry through its official body, the Natural Gas Association of America. Manual defining efficient utilization and conservation was prepared by the bureau and distributed by the association to natural gas consumers.

Famous Smackover field in Arkansas was discovered by a wildcatter.

New Mexico became a gas producing state with completion of its first gas well. The 2428 ft well opened up the Ute Dome gas field in San Juan County.

U. S. Bureau of Standards begins study of soil corrosion.

Rotary displacement meter introduced to the gas industry.

Reginald D. Doul, Consolidated Gas Company of New York and the association representative to the National Board of Fire Underwriters, suggested at the annual A.G.A. meeting "use and sale of flexible tubing should be absolutely prohibited, because not only is it a menace to the general public, but it seriously affects the reputation of gas appliances, especially gas heaters.

AMERICAN GAS JOURNAL published its first catalog and directory — a 400-page volume that contained data on engineering, plant equipment and a comprehensive directory of gas companies.

F. Victor Westermaier presented the following facts on gas lighting at the meeting of the New England Association of Gas Engineers: *Incandescent gas street lighting had its beginning in this country in 1896 with installation of 285 lamps; its growth for a period of 18 years was phenomenal, reaching its maximum in 1914 with a total of over 230,000 lamps. In 1922, 200,000 incandescent mantle lamps in approximately 180 towns remain. Total annual consumption of gas by these street lamps is approximately 3,000,000,000 cu ft.*

Emperor of Japan cabled an American manufacturer in Pittsburgh his order for two automatic gas water heaters.

1923

Industrial gas utilization received considerable industry attention this year, as A.G.A. created an Industrial Gas Section on June 6, following enthusiastic approval by a vote of the general membership. At the Massachusetts Institute of Technology, an industrial gas course was established with the first classes conducted by the New England Association of Gas Engineers.

Public Service Company of Colorado was formed by consolidation of Denver Gas and Electric Light Company and the Western Light and Power Company of Boulder. The new firm was a subsidiary of Cities Service Company.

Radio and broadcasting were still "very new" in 1923 when Rochester Gas and Electric Corporation decided to use the new medium to promote sales. The utility established its own "radiophone" station — 8XQ — as a new form of advertising and to help create "good will." The radiophone was built in the company's experimental department and, reportedly, worked very well.

Oklahoma displaced West Virginia as the leading state in natural gas production.

Natural gas industry passed the one trillion cu ft mark in the quantity of gas produced and marketed.

Big Lake field first major discovery in West Texas.

Executive board of A.G.A. approved plan to raise a fund to start an appliance testing laboratory. East Ohio Gas Company set up temporary testing laboratory facilities in Cleveland.

New York City celebrates 100th anniversary of gas.

1924

Study of gas measurement by orifice meters was begun by Natural Gas Association of America. Much of this work was done in cooperation with the American Society of Mechanical Engineers and the U. S. Bureau of Standards.

First long distance, all-welded natural gas pipeline completed by Magnolia Gas Company of Dallas. Line consisted of 14, 16, and 18-in. pipe, acetylene welded, and ran 214 miles from Webster Parish field in Louisiana to Beaumont, Texas.

Waterless gas holder introduced in U. S. by Bartlett-Hayward.

1925

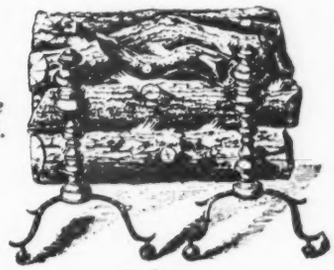
A.G.A. Testing Laboratory established at Cleveland, on June 1. It was founded to promote and insure safe and satisfactory gas service to consumers, through research, formulation of standards, and testing of appliances.

Spherical storage tank adapted to storage of gas under pressure by Chicago Bridge and Iron Works; known as the "Hortonsphere," it was the outgrowth of tanks used earlier for gasoline storage. First tank of this type was erected at Phoenix, Arizona, had diameter of 57½ ft.

Seamless large diameter steel pipe was developed and became available to the gas industry. An important advance in technology, it paved the way toward construction of large diameter pipelines capable of carrying higher pressures. Use of this pipe with welded joints also effected a reduction of internal friction.

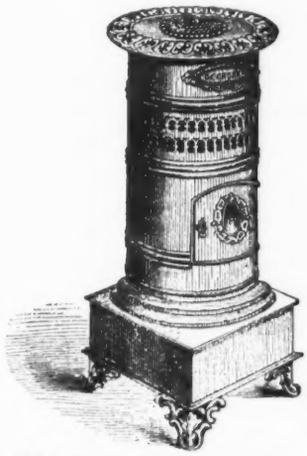
No Logs to Chop, Coal to Shovel, Ashes to Haul

Gas log heater was made by American Meter in 1883.

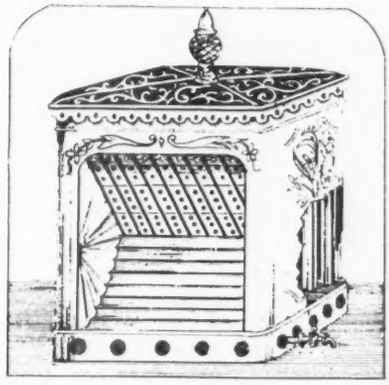


Gas Logs.

Office stove was offered the prudent businessman in 1866.



Office Stove—Consumption 12 ft.



Room heater designed by Prof. Lowe.

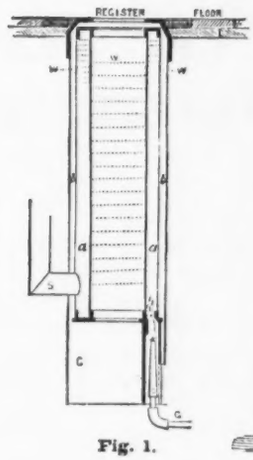


Fig. 1.

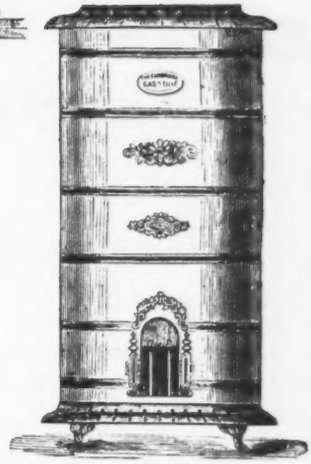
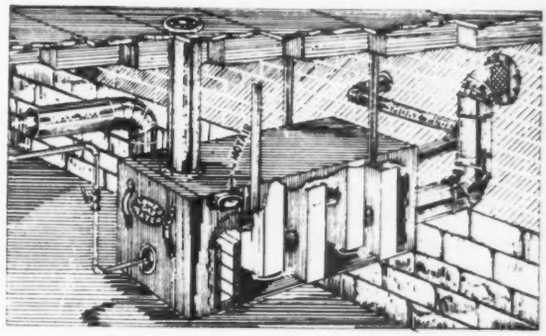


Fig. 3.

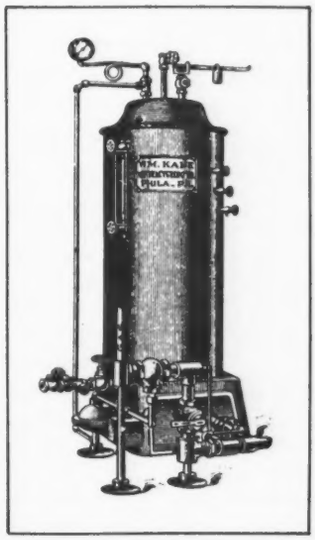
Cambridge Gas Stoves (1869) were designed to be placed in basement or under floor in room to be heated.



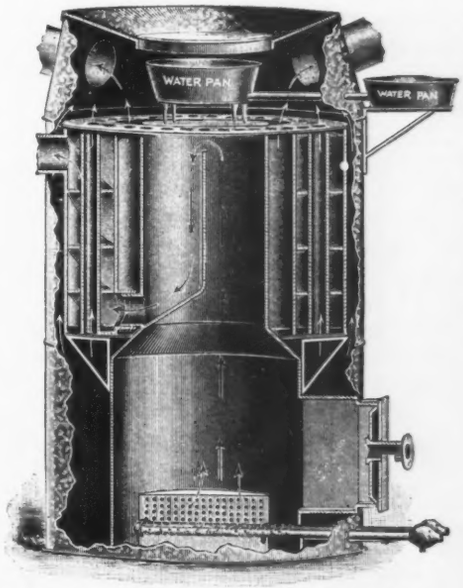
Hot air house heating furnace designed in 1884 by Prof. T. S. C. Lowe was suspended from ceiling joists.

Fig. 1.—Front View.

Jewel room heater 1894.



Gas-fired steam boiler, invented by Wm. Kane in 1896.



"Modern" gas-fired hot air furnace by Pennsylvania Gas Furnace Company, 1894.

Diary of an Industry

Swedish Electrolux Company sent a representative to the U. S. to dispose of the Platen-Munters electric refrigerating system. Rights were acquired by Servel, Inc. Nicholas F. Brady, chairman of the board of Servel, was also head of New York Edison Company and Consolidated Gas Company of New York. He wished to substitute a gas flame for the electric energy. Ultimately, a mechanical refrigerator without use of electricity or any moving parts was developed by a Servel engineer and the utilization department of Consolidated Gas Company.

1926

Era of long distance natural gas pipelines began with construction by Interstate Natural Gas Company of a 170 mile, 22-in. line from the Monroe field to Baton Rouge, Louisiana. Work was started in May and completed in December and represented a pioneering effort in the construction of large gas lines through low, swampy terrain.

Columbia Gas and Electric Corporation (later to become Columbia Gas System) formed by merger of Ohio Fuel Corporation and Columbia Gas and Electric Company.

Baird, a Scot, patented the television.

U. S. Bureau of Standards, working with the A.G.A., API, and ASME, initiated technical meetings to study corrosion problems, cathodic protection, and pipe coatings.

First recorded use of a "rolling rig" for revolving pipe during application of coating; device used on the 22-inch line from Monroe to Baton Rouge, Louisiana.

First Servel gas-fired refrigerator described in the JOURNAL. "Machine has internal working pressure of 235 to 266 psi. Production line boxes have thermostatic control that will hold temperature between 38 and 40 F. All joints are gas welded, as electric welding is too porous for the hydrogen used in the sealed refrigerating cycle. Each unit is tested to 3000 psi. Only one size available initially — a 7 cu ft model. Comparative cost of operation in New York City was $2.77 per month, compared to average of $4.00 or more for electric compressor-type refrigerator."

Cities Service Company organized as holding company.

1927

First Servel gas refrigerator installed on lines of Consolidated Gas Company of New York in March. By June, over 1000 units had been installed.

Three gas-fired refrigerators (other than Servel) were described in the July 16 issue of the JOURNAL — the "Sorco," the "Common-Sense," and the "Ice-O-Lator." All three were intermittent cycle refrigerators, the Ice-O-Lator described as an adsorption machine, the other two as absorption machines.

Cities Service Gas Company laid a 250-mile, 20-in. line from the Panhandle fields to Wichita, Kansas, the longest gas line in the U. S. at the time.

First natural gas field in Michigan discovered two miles from Muskegon; that city became first in the state to use gas from the field.

Investigations begun by A.G.A. committees on use of mechanical joints for cast iron pipe.

Further advance in pipe manufacturing methods was introduction by A. O. Smith Corporation of high strength, electrically welded line pipe. Mass production of large diameter steel pipe with less wall thickness was now practical.

Buttonwillow dry gas field was discovered in Kern County, California.

Natural Gas Association of America was merged with American Gas Association on August 1.

AMERICAN GAS JOURNAL changes to monthly in August, buys and absorbs *Gas Industry* magazine.

Equitable Meter and Manufacturing Company purchased Pittsburgh Meter Company; new firm known as Pittsburgh Equitable Meter Company.

Minneapolis-Honeywell Regulator Company formed by merger of Minneapolis Heat Regulator Company and Honeywell Heating Specialties Company.

1928

Research begun on possible use of gas as fuel for system to produce cold air for summer air conditioning. A.G.A. committee on Natural Gas Research made 15 installations.

Texas became top producer of natural gas, taking the lead from Oklahoma.

First butane-air gas plant installed at Linton, Indiana, replacing a coal-gas plant.

Gas-fired unit heater, hung from ceiling joists or beams, introduced to gas industry at A.G.A. convention; heater represented important development for industry.

New Orleans begins large scale application of cathodic protection to its gas distribution system.

Method for "reforming" high Btu gases — such as refinery gas — into gases with Btu and physical characteristics similar to city gases then distributed, is perfected by Perry of the U.G.I. company.

Electric-arc welding used on section of Mississippi River Fuel Corporation's line in Louisiana, first major gas pipeline electric-welding job.

First commercial pipe coating plant established to perform mill-coating-and-wrapping of pipe.

In June, Denver and Pueblo, Colorado, changed to straight natural gas piped by the longest and largest natural gas pipeline in existence at that time. Gas was transported through approximately 200 miles of the Canadian River Gas Company line from Amarillo in the Panhandle field to Clayton Junction, New Mexico, where it connected with the Colorado Interstate Gas Company's 254 mile, 20 and 22-in. line.

Construction of a 100-mile, 18-in. extension of the Monroe field to Baton Rouge pipeline to New Orleans was completed, bringing that city its first natural gas.

El Paso Natural Gas Company organized, announces plans to build 210 mile line from Lea County, New Mexico, to El Paso, Texas.

1929

On January 1, the city of Memphis received its first natural gas service. Supplied from Monroe field, it was introduced through the Memphis Natural Gas Company's 210 mile, 18-in. line completed at the end of 1928 at a cost of $6,000,000.

Stock market crashed on October 29.

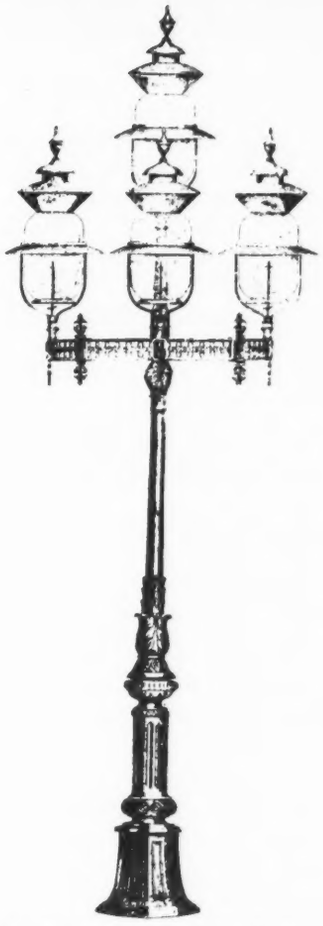
On August 16, natural gas was first delivered to San Francisco, Oakland, and San Jose from the Buttonwillow and Kettleman Hills fields. The 297-mile line built by Pacific Gas & Electric Company of 16, 20 and 22-in. pipe was one of the first large diameter, long distance gas lines of all welded construction.

Angle-type gas compressor-engine units introduced.

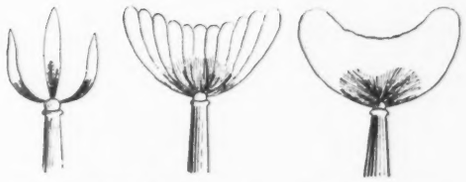
Southern Union Gas Company was organized.

Southern Natural Gas system — from Louisiana fields across the southern states — began construction. First natural gas was delivered in December to a lime kiln near Birmingham, Alabama.

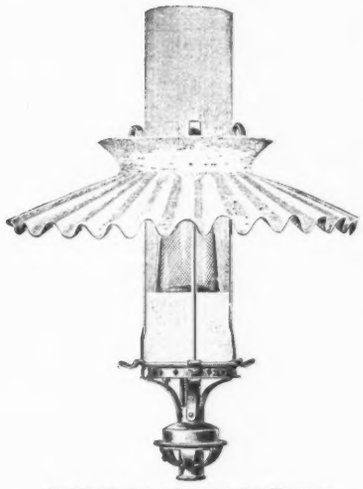
Lamps & Burners:
"Let There Be Light"



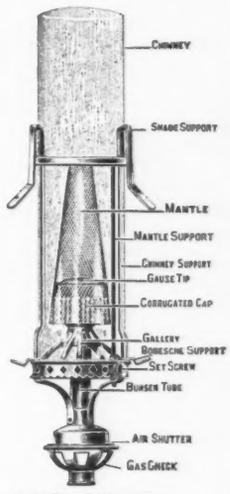
Bartlett boulevard globe cluster, 1890's.



(From right to left): The Cocks-comb Burner, the Fish-tail Burner and the Bats-wing Burner

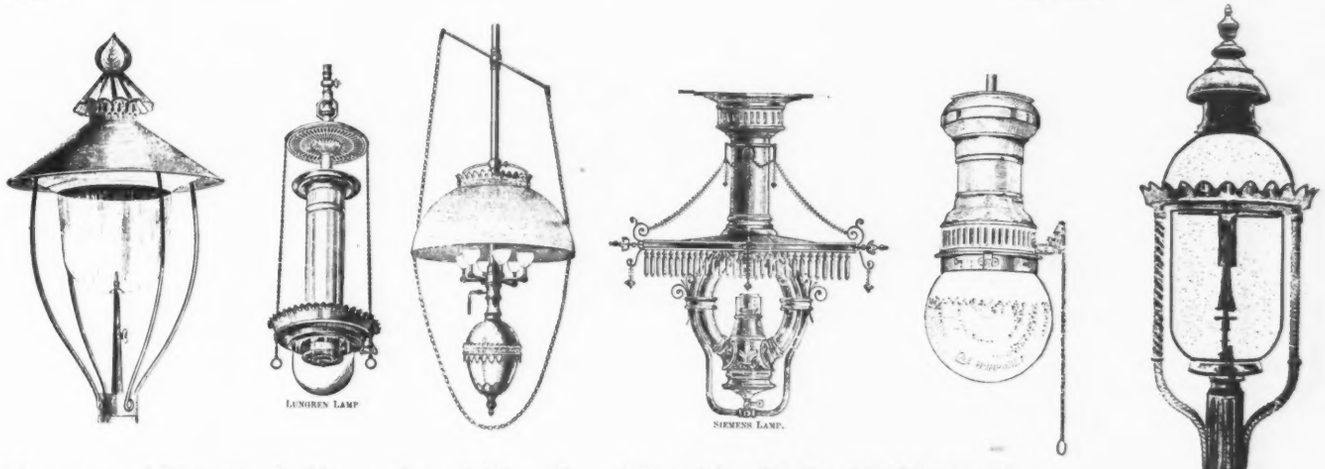


Welsbach Incandescent Gas Burner.

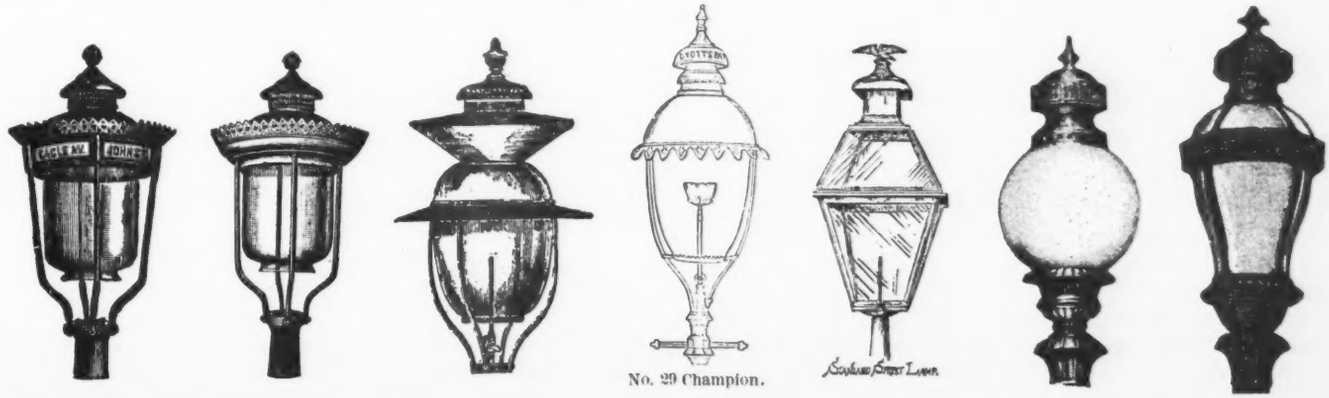


Details of Burner.

Combination gas light and post-box, 1859.



Many types of lamps dot the history of gas lighting. Above, left to right, Miner's original boulevard globe; the Lungren lamp, the Albo-Carbon open flame light, Siemen's regenerative light, Humphrey inverted mantle lamp, and Welsbach's immortal street lamp. Below, l. to r., two Miner lamp designs, a Bartlett, two Standard models, and two Welsbach models.



Diary of an Industry

1930

Construction began on 1000-mile, 24-in. Natural Gas Pipeline Company of America line between Chicago and the Panhandle-Hugoton area; most of line was electric-arc welded, one of the first major jobs of its type.

Peoples Gas Light & Coke introduced the first "therm" rate in United States in August.

"Dad" Joiner's well came in October 3, opening the great East Texas gas and oil field.

Southern Union Gas Company built 200 miles of 10 and 12-in. line from the San Juan Basin to Albuquerque and Santa Fe, New Mexico; this was the first gas line to cross the Continental Divide.

United Gas Corporation organized from group of small natural gas companies in the Gulf Coast area.

Missouri-Kansas Pipe Line Company (later Panhandle Eastern) begins construction on 1250-mile line from Panhandle fields to Indiana state border.

Northern Natural Gas Company organized.

1931

In a period of depression, it was recorded this year that the natural gas industry afforded some stabilizing influence through its pipeline expansion activities. About 7700 miles of transmission lines were constructed at a cost of $318,265,000, utilizing approximately 75 percent of the total steel pipe tonnage produced in the U. S.

First natural gas supplied to Washington, D. C. through a 20-mile, 12-in. line from Rockville, Maryland. Washington Gas Light Company changed to a mixed gas of 600 Btu.

Natural gas came to Chicago in October and Peoples Gas Light and Coke Company started distributing 800 Btu mixed gas.

Construction completed on Panhandle Eastern Pipe Line Company's line from the Hugoton-Panhandle field, starting at Dumas, Texas to the western Indiana border.

1932

Depression is felt hard by gas industry, revenues were down 5.1% for the year, manufactured gas sales fell 4.8%, and natural gas sales (due to industry shutdowns) dropped 16%.

Pittsburgh Equitable Meter Company acquired Nordstrom Valve Company; new firm was later to become Rockwell Manufacturing Company.

Western Gas Company completed a 275-mile, 12-in. line from El Paso to Douglas and Bisbee, Arizona, and to Cananea, Mexico.

"Faraday" gas refrigerator was introduced by General Motors in February. An absorption-type unit, it apparently was a victim of the depression, for little mention is made of it after 1932.

1933

Chicago first city to go into house heating business in big way. Panhandle natural gas was being mixed with manufactured gas to provide 800 Btu gas. First attempt at mass merchandising of gas house heating equipment began at Peoples Gas Light & Coke Company and by July more than 10,000 installations, mostly conversion burners, had been installed.

First air-cooled gas refrigerator unit introduced after lengthy testing.

Michigan Natural Gas Corporation laid a 157-mile gas line from midstate fields to Flint and Pontiac.

A.G.A. committee on industrial gas research reported on "summer air conditioning," noted that experiments in seven residences showed operating costs ranged from 15.26¢ per hour in Chicago and 17.2¢ per hour in Dallas to 32.8¢ per hour in Westchester, New York.

First college course in natural gas engineering was offered by the University of Oklahoma.

1934

Natural gas introduced in Minneapolis. Conversion to 800 Btu mixed gas was completed by June 1, 1935.

Servel reorganized under Louis Ruthenburg, who made economies in manufacturing of gas refrigerators.

Gas industry exhibit at 1934 Chicago "World's Fair" featured "gas in the home."

At annual meeting, on October 31, A.G.A. membership unanimously approved resolution declaring the Tennessee Valley Authority electric power giveaway program to be "unjust and unfair" competition, termed it an "artificial program" founded on government funds to which utilities were forced to contribute.

Arkansas Louisiana Gas Company formed by merger of Arkansas Natural Gas Company and Southern Cities Distributing Company.

1935

Experimental cycling operations were first put into effect in the Big Lake gas field of Texas, where condensate wells, thought to be freak gasoline wells, had been producing large quantities of liquid hydrocarbons for several years.

American standard code for pressure piping was first issued, sponsored by the American Society of Mechanical Engineers and approved by the American Standards Association.

On February 16, Interstate Oil Compact Commission was formed with 6 charter states — Texas, Oklahoma, Illinois, Kansas, New Mexico, Colorado — for the purpose of conserving oil and natural gas by the prevention of physical waste. Congress approved the compact on August 27.

First gas air conditioning units marketed.

"Public Utility Holding Company Act," first introduced as the Rayburn-Wheeler bill, was passed by congress.

1936

JOURNAL began publication of a series of articles on *Pipe Corrosion and Coatings* by Erick Larson. Series was later published as book, and was hailed by gas men as first practical treatise on the subject of corrosion mitigation in the gas industry.

A discovery gas well opened up the great Carthage field in Panola County, eastern Texas.

Detroit received first natural gas from Panhandle fields on July 9 through a 232-mile, 22-in. gas line built from Zionsville, Indiana, to Detroit by a subsidiary of Columbia Gas System.

First use of a "scraper" in large diameter natural gas pipelines was made on the 22-in. Amarillo-Denver line. JOURNAL report noted that it greatly increased the line's capacity.

1937

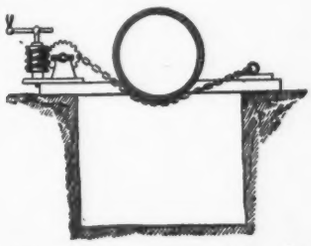
Nearly 1,600,000 gas ranges were sold this year, equalling the peak sales year of 1929.

An explosion of natural gas, piped in for heating purposes, destroyed the Consolidated Public School in New London, Texas, March 18, killing 294.

Gas industry's total sales were up 7.5%, and revenues were up 4.1%.

Tools of the Trade Developed Slowly

Leak detector of 1915 used small hand-cranked fan attached to pipe inserted in a barhole. "Gas" indicator was attached to fan's outlet side.



Apparatus for lowering Mains into Trench, designed by Lewis A. Boore, Buffalo, N. Y., Gas Light Co., 1888.

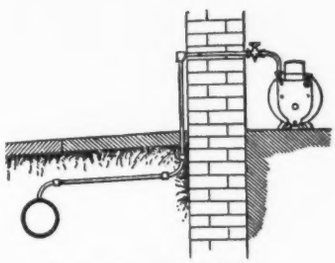


FIG. 2.—WROUGHT IRON SERVICE.

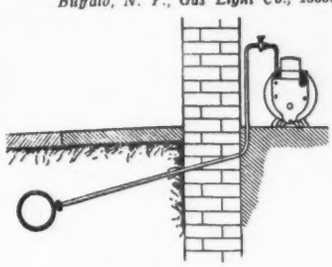
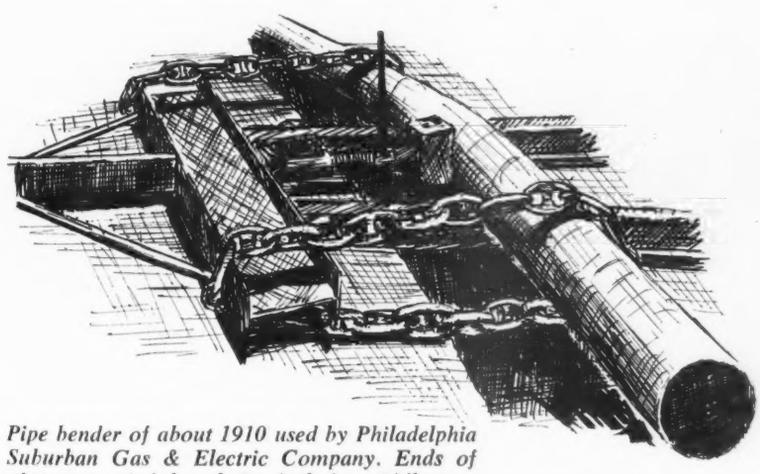


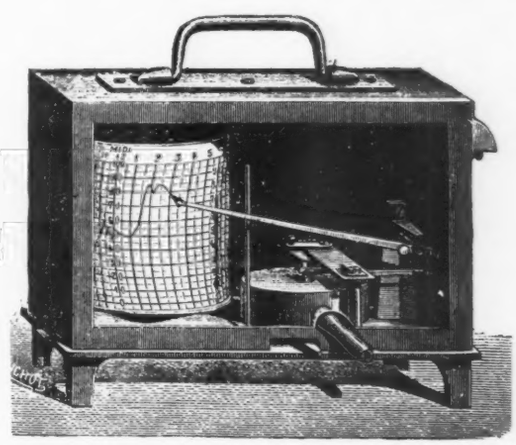
FIG. 3.—LEAD SERVICE.

Typical service line connection practices of 1886.

Introduction of the Monarch portable street lamp in 1913 made possible emergency work at night on mains.

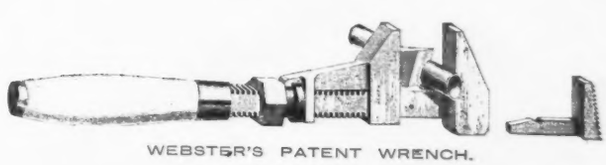


Pipe bender of about 1910 used by Philadelphia Suburban Gas & Electric Company. Ends of pipe were tied by chain, jack in middle was screwed out to bend the pipe.

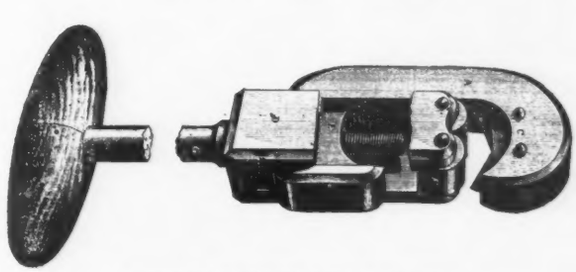


Recording pressure gage made in 1887 by Richard Brothers Company introduced charts, made possible permanent records.

"Gas fitters test gage" was introduced in 1871 by J. G. Knapp & Company, made possible better testing.



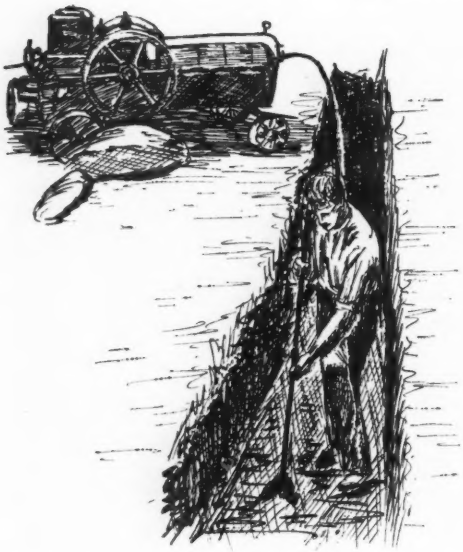
WEBSTER'S PATENT WRENCH.



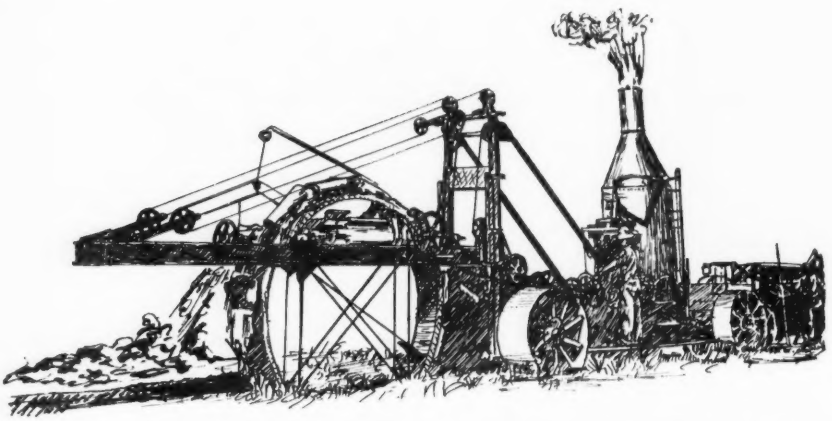
GETTY'S PATENT PIPE CUTTER.

Wrench (top) introduced in 1866 could also be used to cut pipe by use of insert blade. Getty's pipe cutter (bottom) introduced in 1868 simplified pipe cutting and fitting.

Efficiency Came As Machines Replaced Men

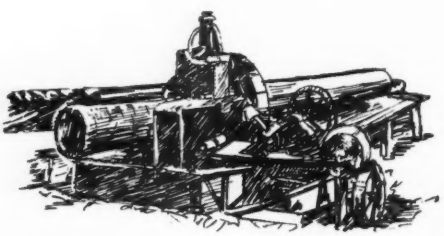


By 1916, small portable air compressors, like this Schramm unit, found many uses, such as tamping trench bottoms and backfill, rock-drilling, and calking pipe joints.



Steam-powered wheel-type trencher, developed in late 1890's by Buckeye, simplified ditch-digging, was major advance in construction equipment.

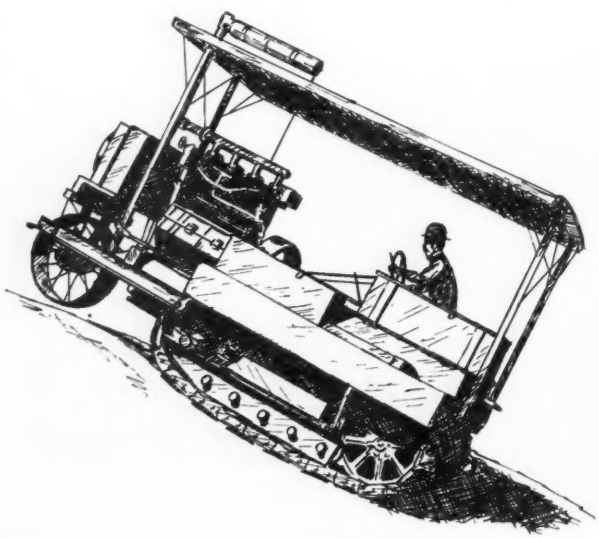
Oxy-acetylene welding crew at work in 1910's.



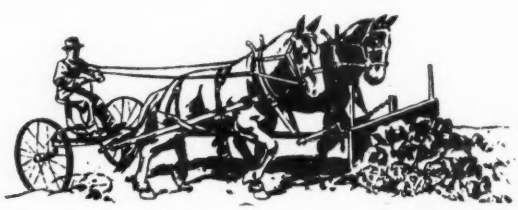
Portable pipe-wrapping machine developed by Pacific Gas & Electric in 1923.

Laying Wooden Mains That Carried Gas Through the Streets of Chicago in 1850

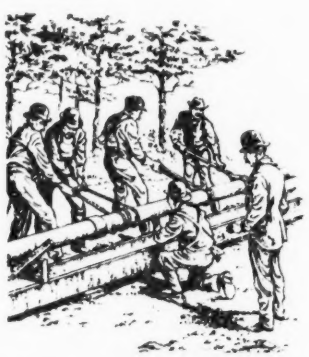
"Bull dozer" at turn of century was a two-horsepower model.



Gasoline-engine powered track-type tractor, developed in 1908 by Holt, was to revolutionize pipeline construction.

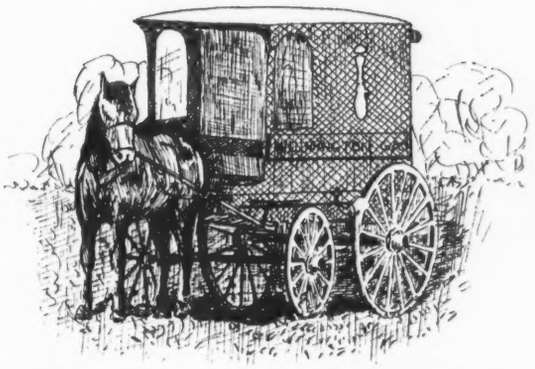


Applying pipe coating by brush method on a 12-in. line required many men.

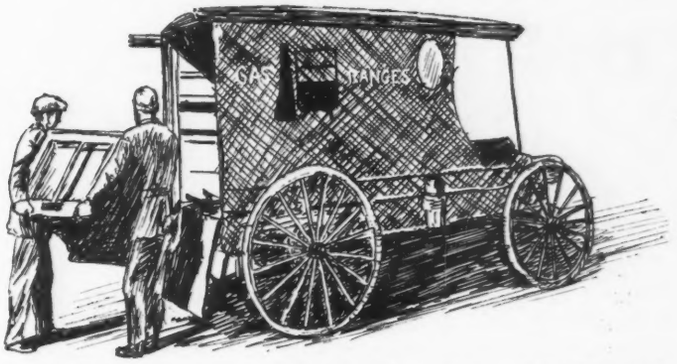


Pipe gangs in early days required plenty of muscles to couple-up the screw end pipes.

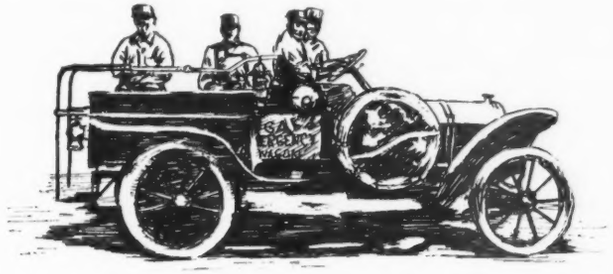
Gasoline Engine, Auto, Truck Brought Changes



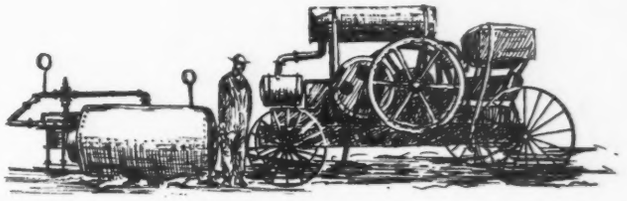
In the days before the horseless carriage Wilmington (Delaware) Gas Company serviceman depended upon "Old Dobbin."



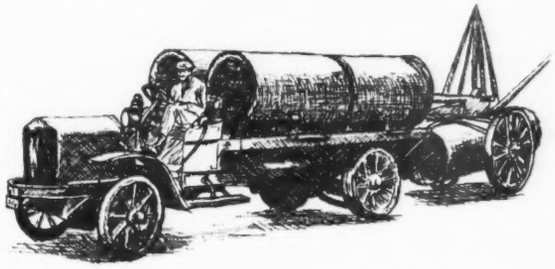
By 1910, gas ranges were being delivered by truck by Elizabethtown (N. J.) Gas Light Company.



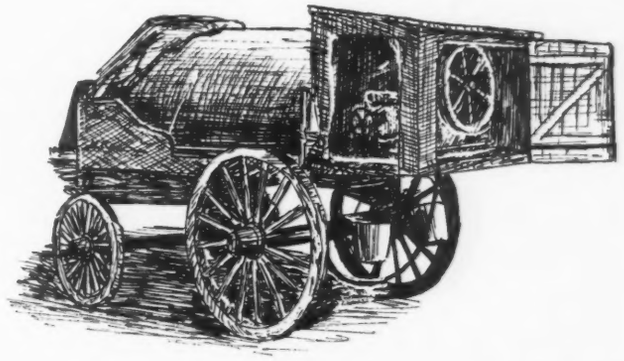
"Gas Emergency Crew" of Consolidated Gas of New York in 1908 proudly sped to emergency calls in this 35-hp touring car.



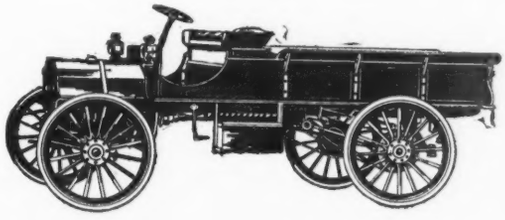
Laclede Gas Light Company, St. Louis, in 1905, used portable air compressor to test both high and low pressure mains.



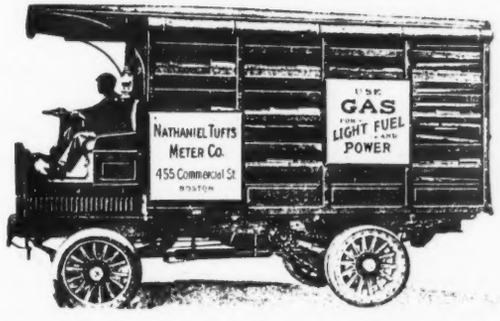
White Motor truck in 1916 was used to haul heavy pipe, using both the truck and a trailer.



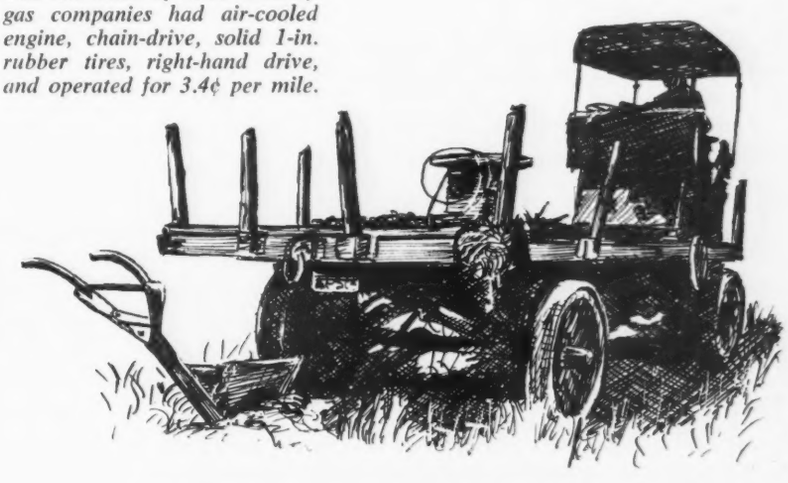
Drip pump wagon used by Detroit Gas Company in 1908 had gasoline-engine-powered pump.



One-ton truck of 1911 used by gas companies had air-cooled engine, chain-drive, solid 1-in. rubber tires, right-hand drive, and operated for 3.4¢ per mile.



Meter company truck of 1911 was 3-ton model, had average speed of 10.4 miles per hour.



San Diego's gas company, in 1916, used truck to pull plow to cut trench for a 2-in. high pressure main.

Diary of an Industry

1938

Natural Gas Act passed Congress on June 14, became operative on June 21. Marked the entrance of the federal government into the field of regulatory control of the natural gas industry. Federal Power Commission given authority to regulate interstate transportation and sale of natural gas.

"CP" range introduced by gas appliance manufacturers and utilities, set new standards in "cooking perfection." Idea was designed to speed up replacement of old ranges.

First Appalachian Gas Measurment Short Course was held at the University of West Virginia.

Michigan Consolidated Gas Company formed by merger of Detroit Gas Company, other gas utilities.

1939

Outbreak of war in Europe; Germany invaded Poland on September 1; President Roosevelt proclaimed a limited national emergency on September 8.

Northern Natural Gas Company built a major extension — a 240-mile, 16-in. line from Sioux City, Iowa, to Minneapolis.

Henry L. Doherty, founder of Cities Service, died on December 26.

Gas industry exhibited at the 1939 World's Fair in New York and at the Golden Gate International Exposition in San Francisco.

1940

First liquefied natural gas was produced at Cleveland, Ohio, climaxing experiments begun in 1937. A plant to serve East Ohio Gas Company was constructed at cost of over $1,500,000 and put into successful operation, supplying the Cleveland area during the 1940-41 winter season.

National defense programs spurred gas industry activity, especially industrial utilization. Home building hit a 10-year peak in 310 U. S. cities.

Industry and business used 55% more gas in 1940 than in 1929, the A.G.A. reported.

1941

Germany invaded Russia; U. S. instigated lend-lease with Britain; Japanese attacked Pearl Harbor on December 7. U. S. entered war.

Pressure gas welding first used near Tucson, Arizona, on two miles of 6-in. line.

Office of Production Management created, set up priorities on acquisition and use of materials, supplies, and equipment that vitally affected gas industry.

Government instituted limits on credit purchases by consumers of "durable goods" that included gas appliances.

Gasification of coal as a means of supplying future demands for gas was suggested in the August issue of the JOURNAL.

1942

Construction began on a 1400-mile, 24-in. War Emergency oil pipeline from Longview, Texas, to the East Coast.

Amended and broadened Section 7 (c) of the Natural Gas Act became effective. This section together with 7 (3) provides for issuance of certificates of public convenience and necessity for the extension, acquisition, construction or operation of natural gas pipelines.

A.G.A. convention scheduled for San Francisco was cancelled.

Women began to replace men as meter readers for gas companies.

War Production Board issued order prohibiting use of gas for new heating installations in 17 states and District of Columbia. Order was to be effective elsewhere whenever gas supply shortage occurred.

1943

Construction of the "Little Big Inch," the War Emergency 20-in. oil products pipeline began April 23, between Beaumont, Texas, and New York area, a total of 1475 miles. Cost was $67.3-million.

Tennessee Gas and Transmission Company began construction on a 1265-mile, 24-in. natural gas pipeline from South Texas to West Virginia.

Double coat, double wrap machine developed and used for first time in applying protective coatings to pipe.

Consolidated Natural Gas Company formed to acquire five gas utility properties held by Standard Oil (N. J.).

Army bomber crashed into and destroyed 20,000,000 cu ft gas holder in Chicago.

A.G.A. celebrated 25th anniversary.

1944

On October 20, explosion and fire wrecked the liquefied natural gas plant of East Ohio Gas Company in Cleveland, killing at least 135 persons. Plant was subsequently abandoned as utility developed nearby underground storage.

FPC initiated a "natural gas investigation" to consider problems relating to the production, transportation and utilization of natural gas "and such related matters as may be helpful in the administration of the Natural Gas Act or in determining what additional legislation, if any, should be recommended." Hearings began on September 18 of the following year and were concluded on August 2, 1946. *Hearing record totaled 14,434 pages of transcript and 477 exhibits.*

On October 31, the Tennessee Gas & Transmission Company began delivery of natural gas through its 1265 mile pipeline from the fields in Nueces County, Texas, to its terminus, Hope Natural Gas Company's Cornwell station in West Virginia.

1945

V-E Day — German armies began surrendering May 4, 1945. Unconditional surrender was signed May 7 in Rheims headquarters.

Japan surrendered August 14.

Nine A.G.A. meetings cancelled in interest of war effort.

War Emergency "Big Inch" pipeline converted during winter to natural gas line as emergency measure to supply fuel-short Appalachian area; line is operated by Tennessee Gas Transmission Company under short-term lease.

First offshore lease sale by State of Louisiana held August 14.

Rationing of gas ranges and heating equipment ended on July 31.

El Paso Natural Gas announced plans to build a 1200-mile system, including a 720-mile, 26-in. line from Permian Basin in West Texas to California.

1946

Gas Appliance Manufacturers Association name adopted by the Association of Gas Appliance and Equipment Manufacturers, founded in 1935.

Southern California Gas Company began installation of plastic services.

Peace River, Alberta, in Canada, became northernmost natural gas outpost with granting of franchise to S. Hector.

First *Gas Technology Short Course* held at Texas A&I College in Kingsville, sponsored by Southern Gas Association.

1947

Texas Eastern Transmission Corporation bought 20-in. and 24-in. War Emergency Pipe Lines, converted them from crude and products service to natural gas transmission lines, bringing natural gas from Texas to New Jersey. The company paid $143,127,000 to the War Assets Administration for the lines. Sale was largest single cash transaction in history of gas industry.

Nation's capital joined the ranks of straight natural gas users in October when Washington Gas Light Company completed its conversion from mixed gas service.

El Paso Natural Gas Company began supplying California on November 13 with its first Texas natural gas.

1948

New Servel "all-year" gas-fired air conditioner introduced and marketed, result of 13 years of research.

Texas Gas Transmission, Memphis Natural Gas Company, and Kentucky Natural Gas Corporation merge to form new 1051-mile natural gas transmission system.

X-ray inspection of pipe welds comes into general use.

FPC, in May, authorized construction of the 1840-mile, 30-in. Transcontinental Gas Pipe Line from south Texas to New York.

"Phillips Case" hearings begun by FPC, were to eventually bring about Supreme Court ruling that independent natural gas producers were, too, under federal regulation. *(11 years later, the case was still being heard.)*

Construction began on Michigan-Wisconsin Pipe Line system — 1000 mile, 3-in. line from Panhandle to Detroit.

1949

First natural gas to be delivered to New York City arrived at Staten Island, August 22, placing the New York & Richmond Gas Company first among northeastern seaboard utilities to convert from manufactured to straight natural gas.

First gas turbine engine installed at Wilmar, Arkansas, on 22-in. line of Mississippi River Fuel Corporation.

1950

Pacific Gas & Electric begins operation of 34-in. gas pipeline from Topock, Arizona, to San Francisco; gas is supplied by El Paso Natural Gas Company through new 24-in. line from San Juan Basin.

Transcontinental Gas Pipe Line Corporation began deliveries of natural gas to New York City through 1830 mile, 30-in. line.

Federal Power Commission won two victories in its campaign to extend jurisdiction to cover natural gas production and distribution. In the East Ohio case, the Supreme Court ruled that a natural gas distributor, operating solely within a state, but selling gas that moves interstate, is subject to FPC control. *The Kerr Bill, designed to specifically exempt independent gas producers from FPC control was vetoed by President Truman.*

1951

More than 100 underground gas storage fields reported, have capacity of approximately 600,000,000 Mcf. A.G.A. committee appointed to assemble and publish data on underground gas storage.

Construction begun on 1300-mile, 26 and 30-in. Texas-Illinois Natural Gas Pipe Line system from Gulf Coast to Chicago.

1952

Automatic ice-maker introduced in Servel refrigerator.

Brooklyn Union Gas Company converts to natural gas—largest gas conversion undertaking involves 925,000 customers.

Development of Herscher Dome near Joliet, Illinois, as an underground gas storage project is begun.

1953

U. S. Court of Appeals in District of Columbia decides independent natural gas producers should be regulated, reverses FPC's ruling in Phillips case two years prior that it did not have power to do so under the Natural Gas Act.

Laclede Gas Company initiated use of McIlroy Network Analyzer to make gas distribution system design calculations.

1954

Supreme Court, in a 5-to-3 decision, says FPC to regulate wellhead prices of gas of Phillips Petroleum and other independent producers and gatherers of natural gas.

Gulf Interstate Gas Company began laying 30-in. line from Louisiana to West Virginia; is first pipeline to serve solely as a "transportation company" transporting gas for Columbia Gas System companies.

Legislation returning title of offshore lands within historic boundaries to states upheld by Supreme Court.

1955

American Louisiana Pipe Line Company began construction of 1000-mile, 30-in. line from south Louisiana to Detroit area.

Trans-Canada Pipe Lines, Ltd., granted authority to Alberta government to export natural gas; plans made to build 2250-mile line across Canada.

ASA B31.1.8 Code on Gas Transmission and Distribution Piping is released in revised form, establishing new standards and safeguards.

Peoples Gas Light & Coke Company, Chicago, installs 1,000,000th meter.

AMERICAN GAS JOURNAL purchased by The Petroleum Engineer Publishing Company, moved to Dallas.

1956

With January issue, JOURNAL becomes first publication to be edited exclusively for the billion-dollar gas distribution industry.

Construction began on 1487-mile Pacific Northwest Pipeline system, from San Juan basin to Canadian border, bringing natural gas to the Pacific Northwest.

"Burner with a brain" developed, demonstrated.

1957

Arkansas Louisiana Gas Company purchases Servel's air conditioning division and Evansville, Indiana plant, forms Arkla Air Conditioning Corporation as subsidiary.

Smokeless-odorless gas incinerator developed.

Mexican gas imported by Texas Eastern.

Refrigerated propane storage plant built by Atlanta Gas Light Company is first for the gas utility industry.

Texas-to-Florida pipeline given FPC approval.

1958

"Memphis Case" decision by circuit court of appeals stuns gas industry. Decision said pipeline company could not file for rate increase and collect the increase—subject to refund —without unanimous consent of all its customers. Case was appealed to Supreme Court, which, at year's end, reversed the decision.

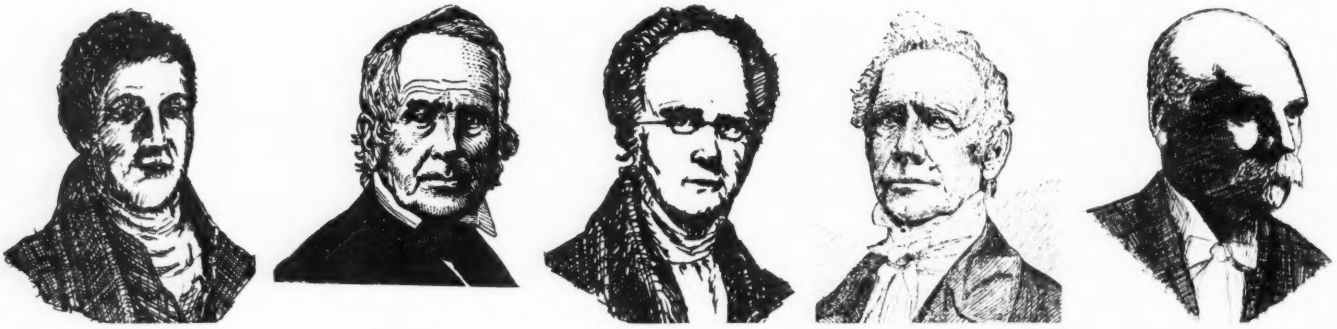
Whirlpool Corporation, St. Joseph, Michigan, acquires Servel's gas refrigeration division and other major facilities.

1959

AMERICAN GAS JOURNAL completes 100 years of service to gas industry, celebrates occasion in October with special *"Diary of an Industry"* issue.

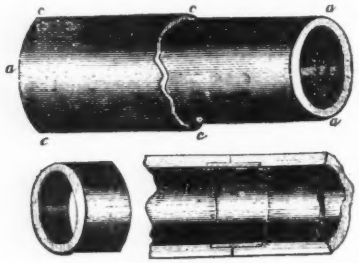
Supreme Court reverses FPC approval of independent producer certificates without price conditions in "CATCO" case.

Portraits, Pipe, and Potpourri



Murdoch Melville Peale Fox Lowe

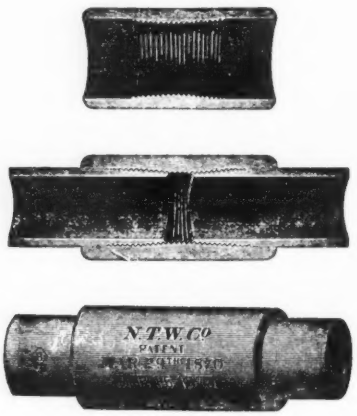
THUMBNAIL SKETCHES: William Murdoch, *"father of the gas industry," a Scotchman, began his career as an engineer for James Watt (inventor of the steam engine); in 1792, Murdoch experimented with distillation of coal in an iron retort, made gas for lighting his house and grounds, piped it through 70 ft of tinned iron and copper pipe.* **David Melville,** *of Newport, Rhode Island, developed a carbureted hydrogen gas apparatus in 1812 and lighted his house; received first U. S. patent for the gas apparatus in 1813.* **Rembrandt Peale** *introduced gas lighting to the U. S. public in 1816 in Baltimore, organized the first U. S. gas company the same year in that city.* **William Fox,** *president of the New York Gas Light Company, was first subscriber to* AMERICAN GAS-LIGHT JOURNAL *in 1859.* **Professor T. S. C. Lowe,** *pioneer in many phases of the gas industry, is probably best known for the water-gas apparatus he developed. Lowe's colorful career also included making gas for balloons used by Union troops in the Civil War to observe Confederate gun positions.*



WYCKOFF BROS. & CO.,
ELMIRA, N. Y.
MANUFACTURERS OF
WYCKOFF'S PATENT IMPERISHABLE
Wooden Water and Gas Pipe.
These Pipes combine
Strength, Durability, and Economy.

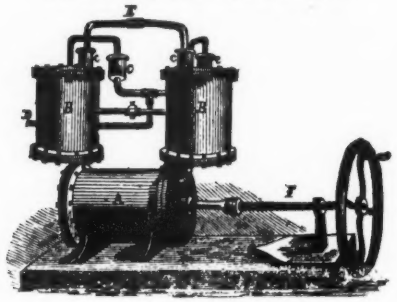
The Water Pipes are the cheapest and best in use for watering Cities and Villages, conveying water to Railroad Tanks, Distilleries, Breweries, Tanneries, and water courses of every description.
Wyckoff's Patent Gas Pipe is less expensive than other kinds, more serviceable and more durable; being coated, inside and outside, with imperishable material, and impervious to air, gas or water, and warranted to give satisfaction. 219tf

Wooden pipe advertisement first appeared in the JOURNAL *in 1869.*



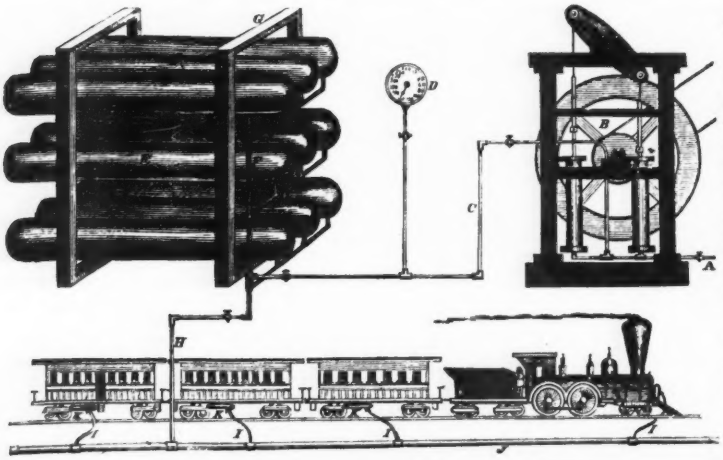
In 1873, sleeve couplings for threaded-end, lap-welded wrought iron pipe were advertised by National Tube Works in the JOURNAL.

[ADVERTISEMENT.]
GWYNNE'S GAS COMPRESSOR.



In 1860, "Gwynne's Gas Compressor" was advertised in the JOURNAL *as an "ideal" apparatus for compressing gas (by hand, of course) into metal cylinders for use in private houses, hotels, steamboats, railroad car.*

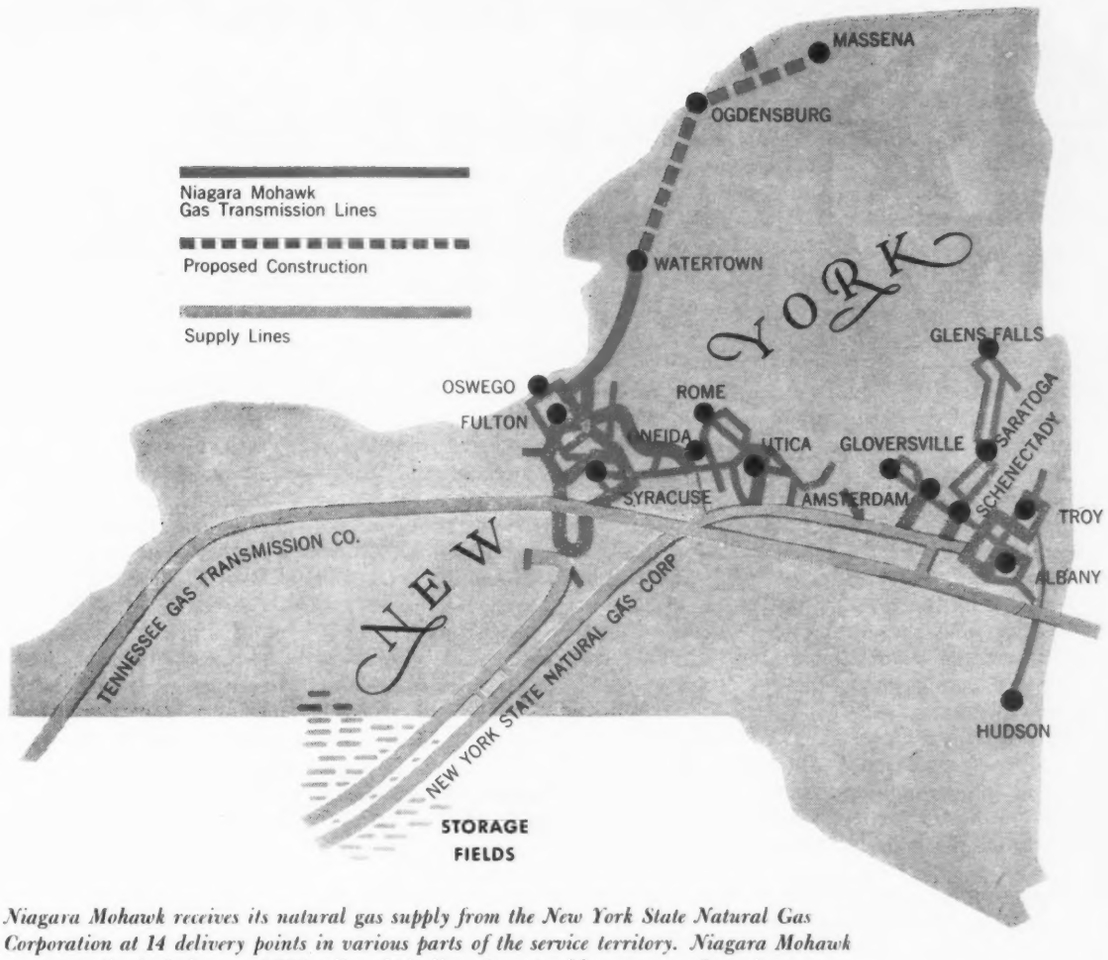
FOR LIGHTING RAIL-ROAD CARS AND STEAMBOATS WITH GAS.



The annexed cut represents the COMPRESSING APPARATUS; also the process of filling the gas-holders on the cars.
A, the inlet pipe from the main.
B, the force pump.
E, a series of cylinders or gas-holders, connected together by the pipe, F, forming a reservoir of the required size.
D, a gage indicating the amount of compression. The gas is taken in from the street, or from any gasometer through the pipe A, and forced into the reservoir E, through the pipe C, to any degree of compression required. The reservoir E, is filled as needed, to draw off into the holders on the cars.
H is a pipe leading from the reservoir E, to the pipe J, along the Station. The flexible hose I, is attached to holders K, underneath the cars. The faucet in pipe H, is opened, the gas passes from the reservoir into the holders on the cars filling them instantly. The hose I, is disconnected from the holders K, and the train is ready to leave. The whole process of filling the holders of a train requires but three minutes.
Where the cars can stand on the track for thirty minutes, the gas is passed directly from the pump B, through the pipes C and H, into the holders K, thus doing away with the reservoir E, entirely; this may be done at either end of the road.
This apparatus has been used on the New Jersey railroad nearly two years and for more than a year on the Camden and Amboy R. R., and the Philadelphia and Reading R. R. The Camden and Amboy R. R. Co. have the apparatus on all their cars, and on two of their Ferry Boats.
The uniform flow of gas is secured by a Patent Regulator.
This apparatus is also adapted to Steamboats making trips of not over three or four days in length, and to the head lights of Locomotives.
The apparatus can be seen in operation at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

APPLY TO THE
New York Car and Steamboat Gas Co.,
No. 117 Fulton St., New York.

Advertisement from 1860 issue of the JOURNAL.



Niagara Mohawk receives its natural gas supply from the New York State Natural Gas Corporation at 14 delivery points in various parts of the service territory. Niagara Mohawk gas properties include over 4,000 miles of pipeline, four stand-by gas manufacturing plants, two liquefied petroleum plants, and 357 compressing, control and regulating stations.

Plenty to Grow on...

Most people think of Niagara Mohawk as an electric power company, but actually we are also an "old timer" in the gas business. Our corporate history shows we've been serving a number of cities for over a century—and the gas side of our operations was started as early as 1841!

Today, the Niagara Mohawk System provides electric service to over a million customers and gas service to 350,000 customers in "Upstate, N. Y." As the map shows, our gas service is concentrated in central, eastern and northern New York.

And it's growing! In 1950, Niagara Mohawk's gas sales totaled about fourteen billion cubic feet. Last year, they were well over fifty billion cubic feet.

"Upstate, N.Y." is right in the middle of one of the world's greatest concentrations of industry, commerce and population. Abundant supplies of natural gas will be a great factor in assuring even more growth and progress in this area in the future.

NIAGARA MOHAWK

'Blue Star Home' Program Designed To Aid Builders, Gas Utilities

HOMEBUILDERS AND GAS DISTRIBUTION UTILITIES interested in capturing a bigger share of the new home market are going to get a lot of help from a new national program being sponsored by the American Gas Association.

The gas industry's new *Blue Star Home Program* is the first industry-wide builder program specifically designed by builders and gas utilities to offer prospective home buyers a guide to modernity and comfortable family living. Sponsored by the Gas Home Bureau of the American Gas Association, the program is the result of a year-long series of meetings and consultations with utilities, builders, and builder associations in all parts of the country.

While national in scope, the Blue Star Home Program is designed to supplement existing local builder programs and provide minimum standards for areas wishing to set up a builder program.

All Blue Star Home promotions will feature the slogan, *Go Modern — Go Gas,* and the *Blue Star Home symbol,* an outline of a house with a blue flame in the center of a blue star.

To identify their programs and products with the national Blue Star Home promotion, builders and gas companies must comply with minimum requirements of the program; they can, however, up-grade these requirements in any way they choose.

Minimum requirements for tract homes call for the inclusion of A.G.A. approved gas appliances for cooking, water heating, and house heating and must make provisions for gas refrigeration, incineration, laundering, and air conditioning where possible. All gas appliances used in Blue Star Homes must meet standards set forth by the Gas Home Committee. For example, gas water heaters must be able to deliver 81-gal of hot water through a 100 F rise in the first two hours of use, with minimum storage capacity of 30 gal.

In addition, the builder must meet functional design requirements providing for more modern, comfortable living.

In model and display homes, the builder must agree to display as many gas appliances as possible, finish and accessorize the kitchen and utility rooms, maintain and man the house properly, and keep it open to the public for a reasonable period of time.

The Blue Star Home Program will be backed by intensive national and local advertising and promotion campaigns. Leading national magazines have scheduled feature stories on Blue Star Homes for 1959 and through 1960.

The A.G.A. Gas Home Bureau will keep builders, utilities, and manufacturers thoroughly informed regarding all phases of the program via newsletters, bulletins, and regional meetings. Ideas will be exchanged and arrangements made for national tie-ins to give the program impact and unity.

A wide assortment of promotional items bearing the *Blue Star Home — Go Modern—Go Gas* theme are available from A.G.A. These include postage meter slugs; window, counter, truck, and bus cards; match books; balloons; decals; bronze discs; directional signs and site signs for tract and model homes; badges; pennants; aprons; banners; brochures; cigarette lighters, and jewelry items.

Promotional materials to be used in support of the gas industry's new Blue Star Home program are discussed by Jerry Mullins, left, manager of A.G.A.'s Home Bureau, and Earl Playford, business promotion coordinator for Columbia Gas System Service Corporation, and chairman of the A.G.A. Gas Home Committee.

Enthusiastic support of the program is already indicated with nearly 50 gas companies, representing every major area in the United States, planning active participation. One utility, Arkansas-Western Gas Company, has already signed up 52 builders in its area to build Blue Star Homes in 1959 and 1960.

Other utilities already in the program include:

Alabama Gas Corporation,
Arizona Public Service Company,
Berkshire Gas Company,
Boston Gas Company,
The Bridgeport Gas Company,
Central Electric & Gas Company,
Central Florida Gas Corporation,
Central Indiana Gas Company,
Cincinnati Gas & Electric,
Citizens Gas Fuel Company,
City Gas Company of New Jersey,
Dayton Power & Light Company,
Gas Light Company of Columbus,
East Ohio Gas Company,
Equitable Gas Company,
Iowa-Illinois Electric & Gas Company,
Indiana Gas & Water Company,
Intermountain Gas Company,
Lone Star Gas Company,
Manufacturers Light and Heat Co.,
Michigan Gas Utilities Company,
Minneapolis Gas Company,
Missouri Natural Gas Company,
Montana-Dakota Utilities Company,
Mobile Gas Service Corporation,
Nashville Gas Company,
NEGEA Service Corporation,
New Britain Gas Light Company,
New Jersey Natural Gas Company,
Northern Illinois Gas Company,
The Ohio Fuel Gas Company,
Pacific Natural Gas Company,
Pennsylvania and Southern Gas Co.,
Portland Gas Light Company,
Providence Gas Company,
Rochester Gas & Electric Corporation,
South Jersey Gas Company,
Southern Union Gas Company,
Southwest Gas Corporation,
United Gas Improvement Company,
Vancouver Island Gas Company, Ltd.,
Western Kentucky Gas Company,
Wisconsin Public Service Corporation,
Worcester Gas Light Company,
Zenith Gas System. ★ ★ ★

Over a Century Ago

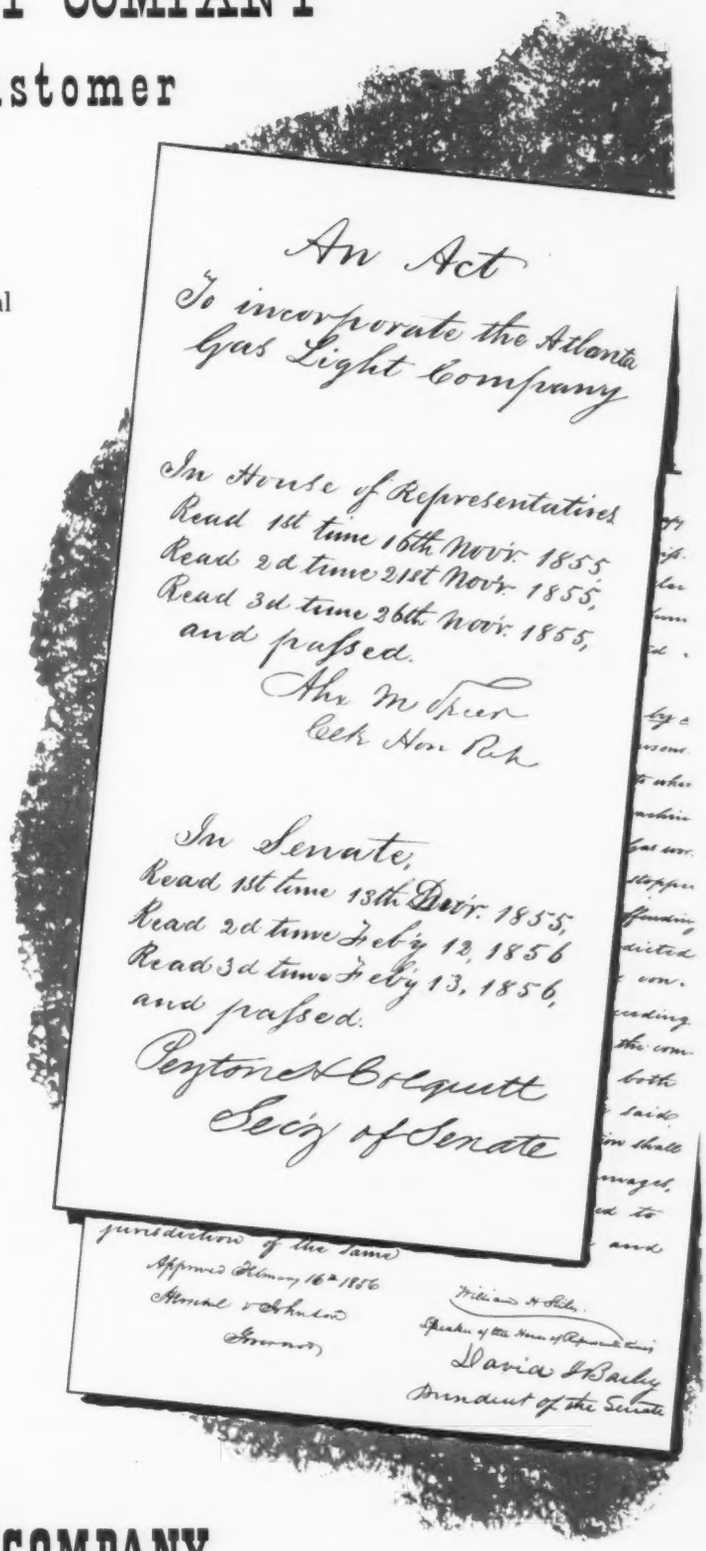
ATLANTA GAS LIGHT COMPANY

Started with One Customer

February 16, 1856—over a century ago—Atlanta Gas Light Company was granted its charter by special act of the General Assembly of Georgia. Some seven weeks earlier the newly founded company had started service to its one customer—the City of Atlanta—with the lighting of fifty gas street lamps on Christmas Day 1855. That one customer, then a little community of 6,000, has grown into a great metropolitan area, reaching a million in population in October 1959 and Atlanta Gas Light Company now serves more than 350,000 customers in 67 incorporated communities and surrounding territory.

Since World War II Atlanta Gas Light Company has contributed to the economic growth throughout the State with an expenditure of more than $75,000,000 in plant expansion—for the installation of new distribution systems, extended service to thousands of customers on existing lines and greatly increased peak shaving facilities. The addition of 806 commercial firms and 112 industries during the past nine months alone is indicative of Atlanta Gas Light Company's part in Georgia's great industrial expansion.

Now in its second century of service, Atlanta Gas Light Company, in step with the Gas Industry, is planning ahead to give Gas ever wider usefulness in the home and in the commercial and industrial development of Georgia.


An Act
To incorporate the Atlanta Gas Light Company

In House of Representatives
Read 1st time 16th Novr. 1855
Read 2d time 21st Novr. 1855,
Read 3d time 26th Novr. 1855,
and passed.
Thos M Speer
Clk Hon Rep

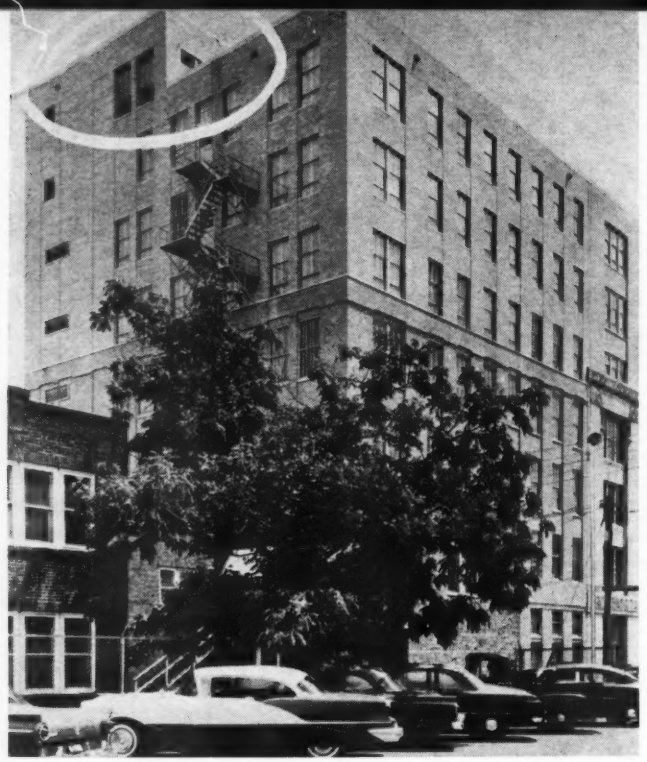
In Senate,
Read 1st time 13th Decr. 1855,
Read 2d time 7 Feby 12, 1856
Read 3d time 7 Feby 13, 1856,
and passed.
Peyton & Colquett
Secy of Senate

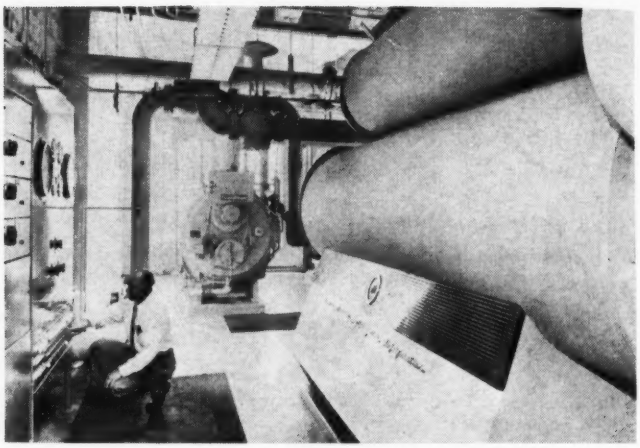
jurisdiction of the same
Approved February 16th 1856
Herschel V Johnson
Governor

William H Stiles
Speaker of the House of Representatives
David J Bailey
President of the Senate

ATLANTA GAS LIGHT COMPANY

Georgia's Largest Distributor of Natural Gas





◂ **Complete comfort control** for the seven-story building originates in the 50 ft by 50 ft penthouse. Included are control center, the two gas-fired 100-hp boilers, 236-ton absorption refrigeration machine, air handling equipment, and exhaust ventilating equipment.

▸ **Penthouse atop modernized,** expanded Lone Star Gas Company building in Fort Worth houses gas-fired steam generating facilities for heating and cooling air conditioning equipment.

Sky-High Steam Plant . . .

"Penthouse" Provides Year 'Round Comfort for Gas Company Building

A. E. Emmett, *Industrial Engineer, Lone Star Gas Company, Fort Worth, Texas*

When Lone Star Gas Company decided to remodel and expand its office building in Fort Worth, Texas, from five stories to eight stories, it became apparent in early planning that existing steam generating facilities would be inadequate to supply the volume of steam required for the absorption refrigeration equipment planned for installation. Existing facilities consisted of one 20-hp cast iron boiler of 15-lb design, and one 50-hp steel standby boiler, both of which occupied about 2500 sq ft in the basement, along with natural gas-powered reciprocating engine-driven compressor refrigeration equipment. These were removed.

Hedrick & Stanley, architects and engineers, of Fort Worth, Texas, designed a "penthouse" boiler and machinery room to be mounted on top of the newly-added seventh story. Specifications called for this room to hold two 100-hp boilers and absorption air conditioning equipment of 236-ton capacity, along with air handlers for the auditorium and cafeteria, and exhaust equipment for the entire building. All of this was to be contained inside a 50 ft by 50 ft area.

Boilers specified by Hedrick & Stanley were compact physical size, forced draft design, and had a low noise level, a particularly important factor considering their interior installation.

Economy of space and weight was very important in this design because structural costs climb rapidly with increases in weight supported and space occupied at eighth-story levels. The two 100-hp boilers, each of 3,350,000 Btu per hour capacity and weighing 10,000 lb each complete, required less floor reinforcement than other units of comparable capacity that weigh up to twice as much. In effect, a saving of almost 50 percent in weight was achieved at no sacrifice in steam production capacity.

Choice of the 100-hp boilers was dictated not by heating requirements, for which 30-hp would have been adequate, but by the 236-ton absorption air conditioning unit that uses approximately 20 lb of steam per ton-hour of operation. This meant that a maximum available steam capacity needed was approximately 125 to 130-hp; the total capacity of 200 hp is well above present requirements, and allows ample margin for further expansion of the building to 10 stories plus penthouse, the design limit.

The new boilers operate at a guaranteed minimum efficiency of 80 percent (compared to 70 percent for the former equipment). Operating costs were thus reduced about 10 percent per unit of capacity, resulting in significant fuel savings per unit of steam produced.

On some milder summer days one boiler can be shut down entirely, and all steam required to operate the air conditioning unit is produced from a single boiler.

The control system on the package-type boiler involved complex electronic components that could make trouble-shooting too difficult for the typical operating engineer. Incorporated into the system used, however, is an automatic programming unit that integrates the timing cycle of the various control functions; this materially reduces potential malfunctions in a control system.

The control unit actually performs more functions than other similar but far more complex systems, but in a simpler fashion. In the event of trouble, two screws can be loosened and the entire programming control can then be removed and quickly replaced with another, causing only a momentary interruption in the boiler's operation.

* * *

In the space age... ***don't sell gas short!***

Fuels are making headlines as never before.

Exotic new mixtures blast rockets into space.

Solar energy recharges an earth satellite's batteries. Ionic propulsion for spaceships is a coming thing.

A nuclear-driven submarine makes maritime history. A nuclear power plant begins operation. (And one of these days, we are told, a little pellet will fuel the family car for years!)

In this exciting era of news-making fuels, ***what is gas doing?***

Gas is winning new customers. In the past decade, natural gas customers have increased by 39 percent to more than 32 million. During the next decade it is estimated that new customers will be added at a rate of more than a million a year.

Gas is providing new and better services... the most modern and efficient appliances... with an overall economy of operation no other fuel can match.

Gas, through research, is exploring new ways to serve the nation.

Gas is providing dependable, low-cost energy so necessary to America's vital defense.

Gas reserves have been brought to an all-time high, with more than 250 trillion cubic feet available for future consumption.

Gas utilities and pipeline companies will invest a record total of $1,859 million for new facilities during 1959.

Gas, to sum it up, is doing plenty.

Most important, we believe — *the industry behind gas is staying alert to the challenge of the future. Imagination and innovation are keeping a familiar fuel fresh and attractive in the public eye. More of this, and we'll make the age of space a dynamic period of growth for gas!*

SOUTHERN UNION GAS COMPANY

serving 325,000 customers in the growing Southwest

home office: Dallas, Texas

NEWSREEL

Nashville Gas Utility Executive Nominated For President of American Gas Association

Wister H. Ligon, president and director of the Nashville (Tennessee) Gas Company, has been nominated for the presidency of the American Gas Association. Elections will be held October 7 at the national gas industry trade association's 41st annual convention in Chicago. Ligon, currently first vice president of A.G.A., is among 29 top executives from gas utility, pipeline, and manufacturer member companies throughout the United States and Canada nominated to serve as officers, directors and section chairmen for 1960.

Other candidates nominated for A.G.A. offices are L. T. Potter, president, Lone Star Gas Co., Dallas, first vice president, and E. H. Smoker, president, The United Gas Improvement Co., Philadelphia, second vice president. Vincent T. Miles, treasurer, Long Island Lighting Co., Mineola, N. Y., has been renominated for treasurer.

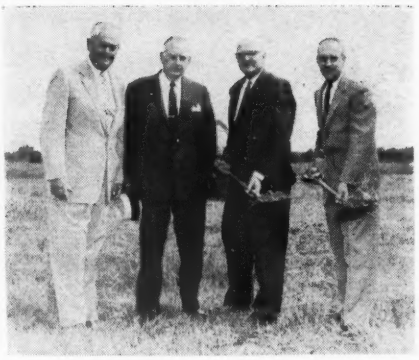
Also nominated were 15 directors, in addition to 10 chairmen and vice chairmen of the Association's Accounting, General Management, Industrial and Commercial Gas, Operating, and Residential Gas Sections.

J. Theodore Wolfe, president, Baltimore Gas and Electric Co., automatically becomes a member of the board of directors upon expiration of his term as A.G.A. president in October.

Candidates named for directors, to serve two-year terms expiring in October, 1961 include Wendell C. Davis, president, Cribben and Sexton Co., Chicago; Buell G. Duncan, president, Piedmont Natural Gas Co., Inc., Charlotte, N. C.; Robert E. Ginna, chairman of the board, Rochester Gas & Electric Corp., Rochester, N. Y.; Elisha Gray II, chairman of the board, Whirlpool Corp., St. Joseph, Mich.; Hall M. Henry, president, NEGEA Service Corp., Cambridge, Mass.; John E. Heyke, president, The Brooklyn Union Gas Co., Brooklyn, N. Y.; Oakah L. Jones, vice president and general manager, The Consumers' Gas Co., Toronto, Ont., Canada; Ralph T. McElvenny, president, Michigan Consolidated Gas Co., Detroit; S. Lloyd Nemeyer, president, Milwaukee Gas Light Co., Milwaukee; Ed Parkes, president, United Gas Corp., Shreveport, La.; John C. Parrott, president, Roanoke Gas Co., Roanoke, Va.; John W. Partridge, president, United Fuel Gas Co., Charleston, W. Va.; N. R. Sutherland, president, Pacific Gas and Electric Co., San Francisco; S. D. Whiteman, president, Kansas-Nebraska Natural Gas Co., Inc., Hastings, Neb.; John H. Wimberly, president, Houston Natural Gas Corp., Houston.

Section officers, to serve for one-year terms are: Accounting Section — chairman: C. H. Mann, treasurer, Columbia Gas System Service Corp., New York; General Management Section — chairman: Otto W. Manz, Jr., executive vice president, Consolidated Edison Co. of New York, Inc., New York; Industrial and Commercial Gas Section — chairman: F. A. Kaiser, vice president and general sales manager, Michigan Consolidated Gas Co., Detroit; Operating Section — chairman: J. T. Innis, vice president, Northern Natural Gas Co., Omaha; Residential Gas Section — chairman: H. William Doering, manager, heating department, Springfield Gas Light Co., Springfield, Mass.

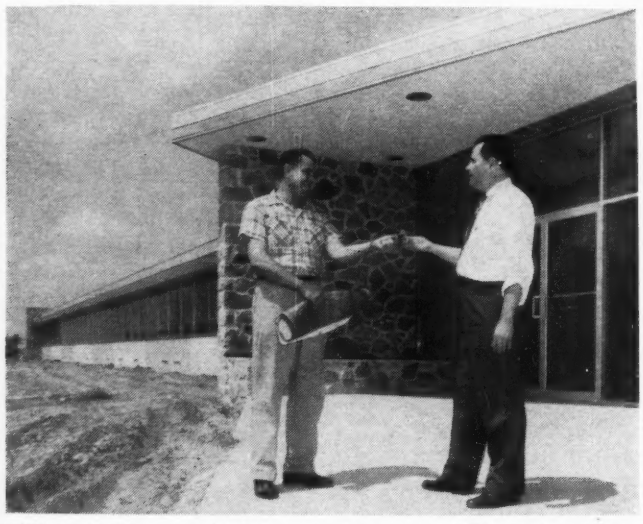
BROOKLYN UNION GAS COMPANY proposes a two-for-one split of common stock, subject to approval of its stockholders and approval of the New York Public Service Commission. At the special stockholders meeting set for October 8, members will be asked to approve the increase from 3,000,000 to 6,000,000 shares of $10 par value common stock.



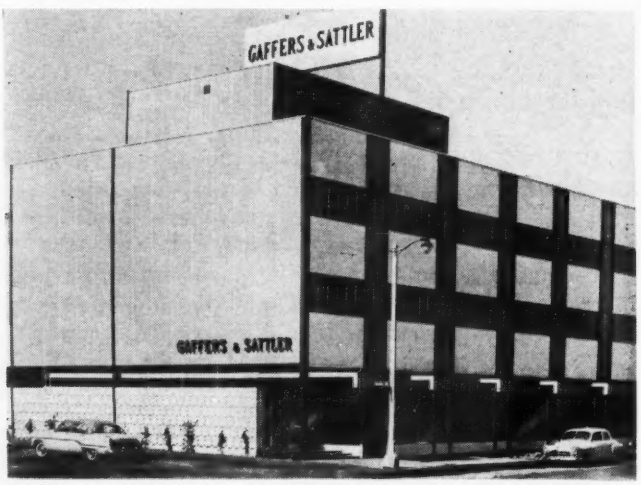
Marvin Chandler, president of Northern Illinois Gas Company, and Harold FitzHenry (right), Glenwood (Ill.) village president, throw first spadesful of dirt during ground-breaking ceremonies for NI-Gas' new eastern division headquarters at Glenwood. Looking on are Edgar E. Lungren, director and retired executive vice president of the utility and Carl J. Sharp, director. The new facilities, two miles north of Chicago Heights, will be completed late in 1960. The two-building center will help replace outgrown facilities in the fast-growing suburban area south of Chicago.

BALTIMORE GAS & ELECTRIC COMPANY plans a two-for-one common stock split, subject to approval by company stockholders at a special meeting to be held in November. Austin E. Penn, executive vice president, said no decision had been made on what new amount of authorized common shares will be voted upon by stockholders. Company now has 9,600,000 common shares authorized.

ARKANSAS LOUISIANA GAS COMPANY proposes a 2 for 1 split of their common stock subject to approval of company's shareholders at a special meeting in Little Rock, Arkansas November 24. Shareholders will be asked to vote on a proposed amendment to the certificate of incorporation to change the presently authorized shares of common stock from 12,000,000 shares of $5 par value to 24,000,000 shares of $2.50 par value.



William M. Harcum (right), general manager of Robertshaw-Fulton Controls Company's Eastern Research Center, receives the keys to the center's modernistic new building from L. B. Evans, superintendent of projects, Day & Zimmerman, the designer and builder. New building, located on the Schuylkill Expressway at King of Prussia in suburban Philadelphia, is designed to accommodate a staff of 100, has 17,000 sq ft of usable space with about three-fourths of the area designed for research and laboratory work. Formerly the research center was located on Fourth Street in Philadelphia.



Gaffers and Sattler's new World Headquarters Building at 8111 West Beverly Boulevard in Los Angeles was officially opened during September marking the 35th birthday of the firm. In September, 1924, Ben Breslow, now president of the diversified appliance manufacturing firm, rented a small one-story building on Los Angeles' south side and started the Utility Sheet Metal Products Company on $750 in borrowed capital. Today, the new $500,000 headquarters building will house all executive and sale personnel for Utility Appliance Corporation and its Gaffers & Sattler brand product division. Firm ships to 80 countries throughout the world, in addition to its national distribution.

Celebrating the installation of service to its 300,000th gas customer in the Greater Cincinnati area, the Cincinnati Gas & Electric Company presented the lucky customer, Herbert F. Schleutker, an outdoor gas light, a gas dryer, and a specially inscribed meter as a memento of the occasion. Milton J. Pfeiffer, vice president in charge of gas department (center) made the presentation in behalf of the 116-year-old utility company.

FIVE NEW DISTRIBUTORS and the opening of a New York City office to handle export sales have been announced by Vickery-Simms, Inc., manufacturer and distributor of commercial orifice fittings and accessory equipment. New distributors include: Hudson Engineering Co., Inc., Birmingham, Alabama; Jack M. Smither & Co., Atlanta, Georgia; Mason & Morris, Inc., Charlotte, North Carolina; Delaware Valley Engineering Co., Inc., Conshohocken, Pennsylvania, and Malcolm W. Black & Co., Inc., New York City. Black Export Inc. of New York will handle export sales in northern New Jersey and Metropolitan New York.

ALLIS-CHALMERS has completed acquisition of Tractomotive Corporation, Deerfield, Illinois, manufacturer of rubber-tired wheel loaders, front-end shovels, rippers, sidebooms, and other construction attachments, and Lakefield Manufacturing Company of Wauwatosa, Wisconsin, Tractomotive's supplier of components for tractor shovels and sidebooms used on Allis-Chalmers construction machinery. Tractomotive will be operated as the Deerfield Works, and Lakefield will be operated as the Wauwatosa Works in conjunction with Deerfield Works.

NEW DIVISIONAL MEMBERSHIPS in GAMA have been granted four firms. All American Metal Products Company, Inc. of Philadelphia, Pa., Laars-Engineers of North Hollywood, California, and Rheem Manufacturing Company have been elected to membership in the Gas Boiler Division. All three have been GAMA members of long standing. H. C. Little Burner Company, Inc. of San Raphael, California, has been elected to membership in the Gas Water Heater and Gas Incinerator Divisions. The Little company has also been a GAMA member for several years.

CRIBBEN AND SEXTON, subsidiary of Waste King Corporation, Los Angeles, has sold its *Constant Comfort* gas space heater business to Suburban Appliance Company, of Whippany, New Jersey. Suburban Appliance, a subsidiary of Suburban Propane Company, manufactures *No Vent* space heaters, water heaters, and clothes dryers, all gas products. Production equipment and inventory will be moved from Cribben and Sexton's plant in Michigan City, Indiana, to Suburban's plant in Dayton, Tennessee.

INSIDE STORY on how to heat homes effectively with hot water is given in a new 30 minute, 16 mm color-with-sound film from A. O. Smith Corporation's Permaglas Division.

WHITE RODGERS COMPANY has opened two new West Coast sales and service branch offices in Los Angeles and Portland to assume duties previously handled by Pacific Scientific Company, as manufacturers' representative. District headquarters for California, Nevada, Arizona, and Hawaii, will be located in Los Angeles. District headquarters for the Northwest area including Oregon, Washington, Idaho, western Montana, and Alaska, will be located in Portland.

IRVIN H. FULLMER, chief of the Engineering Metrology Section, National Bureau of Standards, U. S. Department of Commerce, has been named secretary of the sectional committee B2 of the American Standards Association.

It's a

NORTHERN ILLINOIS Gas COMPANY

fact:

Just completed . . . 140 miles of large diameter pipe line from East Dubuque on the Mississippi to the Northern Illinois Gas Company. This will bring an additional 50,000,000 cubic feet of natural gas daily to the heart of Northern Illinois Gas' fast growing service area . . . **an increase of 12½%!**

Northern Illinois Gas Company ranks 7th among Gas utilities in the United States and serves 280 communities in 20 counties in northern Illinois outside of Chicago

Across the hilly terrain of northern Illinois comes our new Gas distribution line. Problem of this steep hill is solved easily as bulldozer lowers giant trenching machine down the loose-surfaced incline.

***For information** about the Company or area, write:*

Marvin Chandler, President, Northern Illinois Gas Company, 50 Fox Street, Aurora, Illinois.

”

SURE, I WORKED FOR UGI

”

At conventions . . . at luncheons or dinner meetings . . . in committee groups at many places where gas men gather, be it in Peoria or Peach Bottom, Atlantic City or Augusta, sooner or later you'll hear someone say, "Sure, I worked for U.G.I. That's where I started my gas training."

U.G.I. glows with an understandable inner pride as it examines that long list of trained men, from the earliest days of the saga of gas, up to today . . . men whose names are indelibly stamped on the scroll of gas progress.

And with those men, is the long list of machines and processes bearing the initials "U.G.I.", which have helped to bring The American Gas Industry to its present level of importance in making our homes and industries the envy of the entire world.

Now, at the celebration of 100 years of recorded Gas Industry History, U.G.I. salutes "men and machines", the proper coordination of which is the secret of American free enterprise.

THE UNITED GAS IMPROVEMENT COMPANY

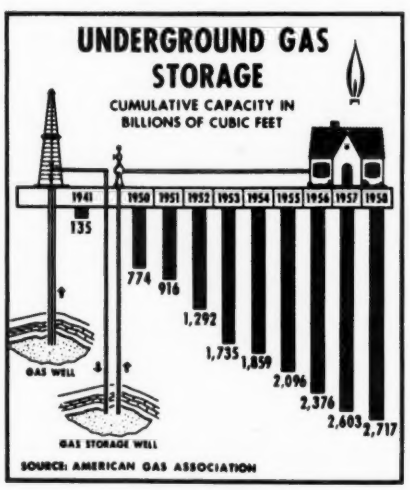
Philadelphia, Pennsylvania

Newsreel

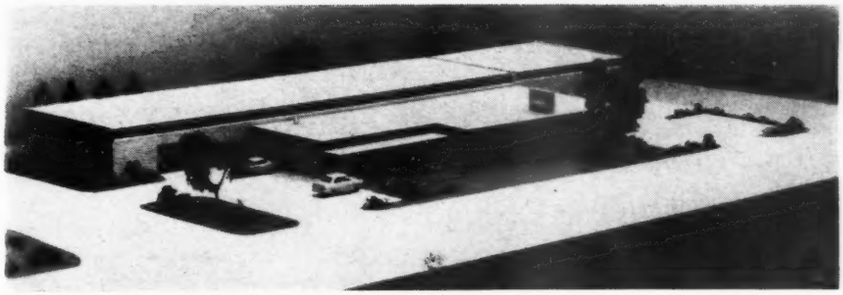
CANADIAN GAS ASSOCIATION has signed a new five year contract with Ontario Research Foundation for testing of gas-fired equipment. Unlike previous testing agreements that were of a verbal nature, both bodies decided that rapid expansion of the Canadian gas industry and increasing use of gas-fired equipment by the public called for establishment of Ontario Research Foundation as the association's testing agent for the Province of Ontario.

A. O. SMITH PERMAGLAS DIVISION has initiated production of Permaglas water heaters at a recently acquired manufacturing plant in Newark, California. The 250,000 sq ft plant has undergone extensive remodeling and repair since its acquisition by A. O. Smith. Production capacity will be 10,000 units a month on a one-shift basis, according to J. H. Brinker, manager of the Permaglas Division.

POLYKEN SALES DIVISION EXPANDS. Alfred J. Spiry, formerly South central sales representative for Polyken, has been named sales head of the International Division, Polyken Sales Department, The Kendall Company, in Chicago. His activities will include all phases of overseas marketing of Polyken tapes and protective coatings products. Donald W. McCabe, previously responsible for marketing of Polyken products in Canada, has joined the Chicago headquarters as assistant merchandise manager. James C. O'Brien is the new Midwest representative, working out of Chicago. Robert L. Toney, Jr., is the new far southwest representative. William F. Lechler, recently with Bechtel Corp., will represent Polyken in the North central territory with home base at Kansas City, Missouri. M. Lamar Bowden, previously West Coast sales representative, is the new Southeast representative. Joseph F. Batteer, John M. McGivern, and James O. Kircher complete the territorial representation with more concentrated territorial assignments in the Northeast, South Central, and Gulf South areas. W. J. Flaherty and Rex Shaw have moved into new functions as sales and service supervisors, eastern and western, respectively.



Underground natural gas storage capacity has increased more than five-fold since 1949. Piped in during low demand periods, this stored gas will help provide heat for more than 20,000,000 homes this winter.



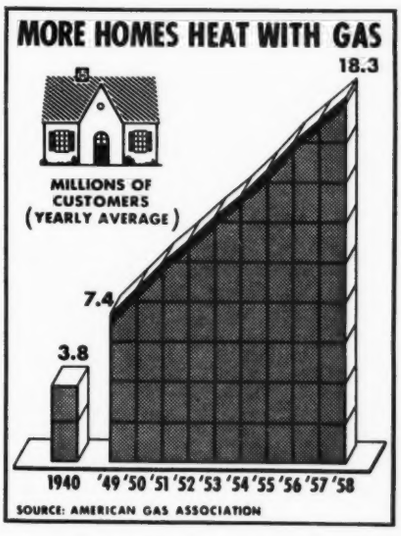
Siemon Manufacturing Company, manufacturers of heating equipment for industry and commercial buildings under the trade mark "Power-Flame," has expanded operations into a new 20,000 sq ft plant and office building in Grandview, Missouri. New plant houses complete factory and laboratory facilities as well as company offices. This is the third expansion move since the company was founded in 1949, according to company president, Charles D. Jones.

O'KEEFE & MERRITT COMPANY, Los Angeles, California, manufacturers of combination washer-dryers, free-standing gas ranges, and gas built-in ranges, has been elected a regular member of the American Home Laundry Manufacturers' Association, bringing the association membership to 19 manufacturers who account for virtually 100 percent of the production of home laundry appliances in the United States.

NATIONAL FIRE PROTECTION ASSOCIATION'S new 10-minute, 16 mm color-with-sound film, "LP-Gas Fire Control," is an on-the-scene report of an outstanding job of fighting an LP-Gas tank truck fire that's suitable for public and industrial fire departments and fire training schools as well as to the gas industry in general.

ROBERTSHAW-FULTON CONTROLS COMPANY is expanding its foreign operation with construction of two new manufacturing plants in Brazil and Italy. Through a newly-formed subsidiary, Robertshaw-Fulton Controls do Brasil S/A Industria E Comercio, R-F plans to build a new appliance controls manufacturing plant in suburban Sao Paulo, Brazil. First production is scheduled for early 1960. R-F and several Brazilian firms, including Serma-Maguinas Contabeis E Services Gerais S/A of Sao Paulo, will own the new Brazilian subsidiary. In Europe, Robertshaw-Fulton plans to build another plant for the manufacture of automatic control devices near Turin (Torino), Italy. The plant will be owned and operated by a newly-formed subsidiary to be known as Robertshaw-Italia S.p.A., that will be owned jointly by R-F and Societa Italiana per il Gas, the company serving gas fuel to most of Italy.

SUPERIOR METER COMPANY, INC., wholly-owned subsidiary of Neptune Meter Company, has consolidated all its operations, including manufacturing and sales, in its main plant in the Bush Terminal Building in Brooklyn, New York. Consolidation involved the transfer of all manufacturing of hardcase gas meters from the plant in Punxsutawney, Pennsylvania, to the Bush Terminal plant that was formerly devoted to tinned gas meters.


MORE HOMES HEAT WITH GAS
18.3
MILLIONS OF CUSTOMERS (YEARLY AVERAGE)
7.4
3.8
1940 '49 '50 '51 '52 '53 '54 '55 '56 '57 '58
SOURCE: AMERICAN GAS ASSOCIATION

The gas distribution industry has added 11,000,000 househeating customers since 1949, bringing the total number of homes that are now heated with gas to more than 18,000,000 — almost 2.5 times as many as a decade ago.

NEW Lancaster VALVE COVER
eliminates practically all troubles from normal sticking and lifting valves . . .
* Gum-resistant ring Specially compounded of friction-free inert carbon-graphite.
* Large-Profile Stud offers greater contact area
New Lancaster Valve Cover has the most level and truly concentric seat surface ever achieved. Special compound of carbon-graphite is strong, shock resistant and silent . . . ends valve squeaks and is far less apt to break or chip in transit, repair or installation.
Large ½-inch stud is made of long wearing nickle-silver. It's rounded and swaged into the rugged brass shell . . . allows continual, positive contact with any driving dog position.
New, Improved Lancaster Carrier Wire Assembly
keeps pans moving in straight line . . .
Side carrier bracket height adjustment assures most accurate positioning . . . oval slots in new center bracket allow straight through diaphragm travel. Center bracket available separately adapts to any carrier wire. Porous bronze graphite bearings throughout.
"a meter is only as accurate as its parts"
Lancaster METER PARTS CO.
Manufacturers of Quality Parts for Gas Meters
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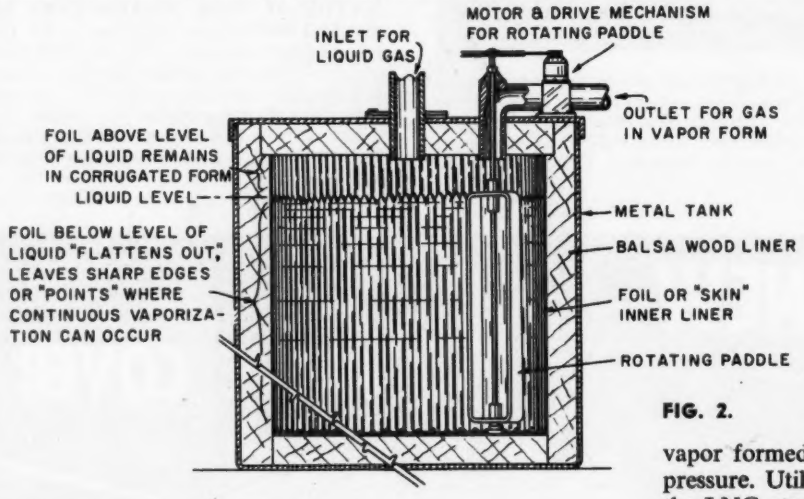
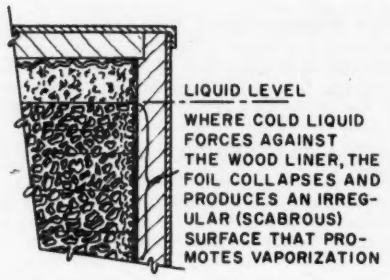
PATENT REVIEW

NEWS ABOUT NEW IDEAS FOR THE GAS INDUSTRY

New Means of Storing Liquefied Methane Utilizes Corrugated Skin-Like Lining


MOTOR & DRIVE MECHANISM FOR ROTATING PADDLE
INLET FOR LIQUID GAS
OUTLET FOR GAS IN VAPOR FORM
FOIL ABOVE LEVEL OF LIQUID REMAINS IN CORRUGATED FORM
LIQUID LEVEL
METAL TANK
FOIL BELOW LEVEL OF LIQUID "FLATTENS OUT," LEAVES SHARP EDGES OR "POINTS" WHERE CONTINUOUS VAPORIZATION CAN OCCUR
BALSA WOOD LINER
FOIL OR "SKIN" INNER LINER
ROTATING PADDLE


LIQUID LEVEL
WHERE COLD LIQUID FORCES AGAINST THE WOOD LINER, THE FOIL COLLAPSES AND PRODUCES AN IRREGULAR (SCABROUS) SURFACE THAT PROMOTES VAPORIZATION

MODIFIED FORM USING "WRINKLED" OR "CRUMPLED" FOIL OR SKIN

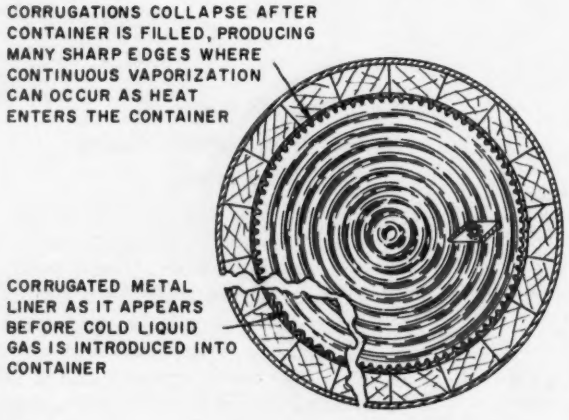

CORRUGATIONS COLLAPSE AFTER CONTAINER IS FILLED, PRODUCING MANY SHARP EDGES WHERE CONTINUOUS VAPORIZATION CAN OCCUR AS HEAT ENTERS THE CONTAINER
CORRUGATED METAL LINER AS IT APPEARS BEFORE COLD LIQUID GAS IS INTRODUCED INTO CONTAINER

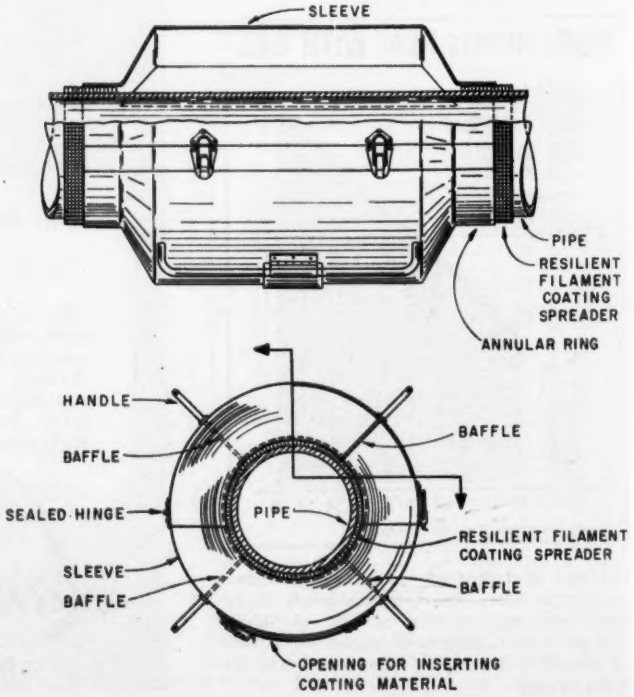
FIG. 1. SECTION THRU CONTAINER USING CORRUGATED FOIL INNER LINER

FIG. 2.

An insulated tank with any impervious lining provides an improved method of storing liquefied natural gases, including methane, at temperatures as low as —258 F at atmospheric pressure. Method described uses a corrugated or scabrous (wrinkled) foil to line the interior of the tank's thick insulating layer of balsa wood. This helps assure safety by keeping the highly corrosive fluid from penetrating the balsa wood layer and contacting the outer metal tank itself. The foil is cemented to the balsa wood. Any paper or fabric material coated to make it impervious to the fluid, can also be used in place of the foil. Additional safety is provided as the corrugated surface of the foil lining is compressed by the hydraulic pressure of the fluid, providing a multiplicity of sharp points (Fig. 1) which form nuclei or points of emergence of vapor as the liquid changes into a gas, thereby minimizing the danger of "bumping" (rapid or "flash" vaporization of large volumes of the liquid) by assuring continuous gentle vaporization. When scabrous foil is used, the pressure changes pocket-like patterns into a similar sharp-pointed surface, as shown in Fig. 2. Further aiding vaporization, a two-blade paddle mounted in the tank is rotated by means of a sealed motor on top of the storage tank. This gentle agitation of the liquid assures a continued and controlled vaporization; the vapor formed is discharged from the tank at atmospheric pressure. Utilizing a corrugated inner skin or lining allows the LNG storage tank to be designed to support only the weight of the liquid; it does not have to be designed to support the gaseous pressure. *U. S. Patent 2,889,953 (1959) June 9. Willard L. Morrison, assigned to Constock Liquid Methane Corporation.*

Cold Pipe Coatings Applied by Baffled Sleeve

Cold pipe coatings can be applied without flooding the pipe by means of a hinged 2-part sleeve that completely encircles the pipe. Each end of the sleeve is reduced to form an annular ring slightly larger than the outer circumference of the pipe. Resilient spreaders within each annular ring (made of carpeting or similar material) spread and level the coating on the pipe. Coating material is poured into the



sleeve through an opening until the desired level is reached, then the opening door is closed and fastened. Sleeve is rotated about the pipe and moved lengthwise to apply the coating to the pipe. As the sleeve rotates, baffles inside the sleeve carry the coating material upward toward the top surface of the pipe and discharge it over the pipe. At the same time, filaments or resilient material in the annular rings spread the coating onto the pipe in a level coating and simultaneously carry the excess coating material lengthwise along the pipe within the sleeve. Coating material can be applied continuously over entire pipe surface as long as any remains within the sleeve, and there is no need to keep the sleeve full of coating material. *U. S. Patent 2,867,188 (1959) Jan. 6. Ruben H. Kuxhaus, assigned to Royston Laboratories, Inc.*

New Pressure-Sealing Coupling Requires No Bolting, No Clamping

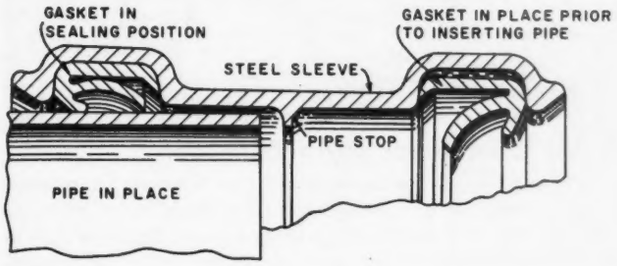


FIG. 1.

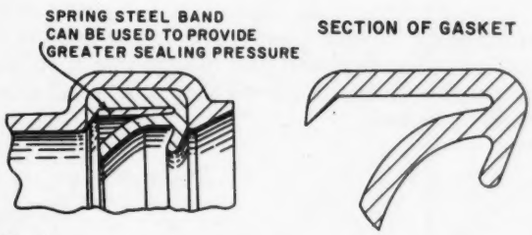


FIG. 2.

New pressure-sealing coupling for plain-end pipe is said to provide simplified installation; pipe sections are merely stabbed into the coupling — no bolting, clamping, tightening, or other operation is required, nor is it necessary to thread, groove, flare, machine or otherwise prepare the pipe ends. Unlike couplings having compression-type gaskets, newly patented invention does not apply pressure that might collapse the pipe, and may, therefore, be used on relatively thin wall metal pipe or on plastic pipe. In addition, coupling can minimize excavation costs as it does not require a trench wider than that necessary to accommodate the pipe. Outside diameter of the coupling is only slightly larger than that of the pipe and has a smooth curved exterior surface—free from bolts, lugs, and flanges —making it easy to coat or cover for corrosion protection. Basically, the coupling consists of a sleeve with a channel at each end, into which is inserted a three-pronged "rubber" gasket. When pipe is forced into the coupling, the outer prong or flange of the gasket seats in the annular channel and the two inner prongs or flanges are compressed against the channel and the outer pipe surface to form flexible pocket seals. In an alternate method, shown in Fig. 2, a circular spring-steel band is placed inside the gasket; this band presses the outer flange tightly into the coupling channel to hold the gasket firmly in place while the pipe is stabbed, assuring a completely tight seal. Invention is also applicable to other fittings, such as tees, valve ends, etc. *U. S. Patent 2,887,328 (1959) May 19. Roger E. Risley and Frederick T. Newell, assigned to Dresser Industries.*

1859...THE AMERICAN GAS-LIGHT JOURNAL published its first issue in New York. That same year Portland Gas & Coke Company started operations in the brand new state of Oregon. One hundred years later the JOURNAL's name has been shortened to THE AMERICAN GAS JOURNAL...we've become the Northwest Natural Gas Company. Congratulations on serving the gas industry with so fine a publication these past 100 years. We look forward to sharing a dynamic future with you.

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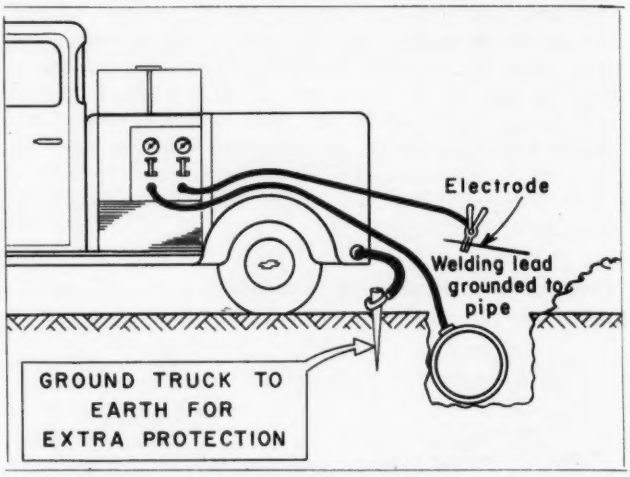
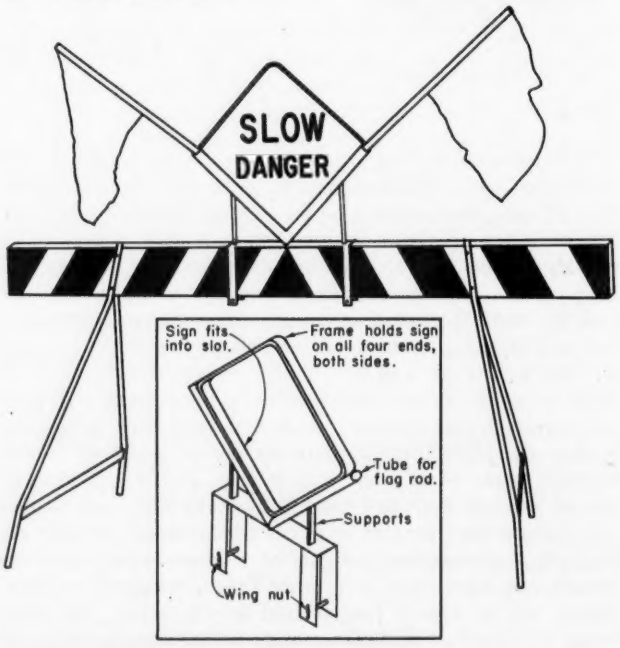
137

Ideas At Work



Extra Ground for Extra Protection

Possible short circuits from the welder or from static charges building up through the truck body from the pipeline through the grounded welding lead on the pipe can be eliminated by grounding the truck to the earth. The grounding method requires that the grounding cable be attached securely to the truck body (preferably welded) and the earth end be driven into the earth or fastened to a metal structure that will provide a good ground. Cable could be attached by welding to a steel post or pipe that is pointed on one end. This protective ground should be installed before welder is started.



Bracket Simplifies Mounting Flags, Signs to Barricade

Attaching warning flags and signs to barricades around construction work on streets, parkways, and similar locations is made easier with this unique bracket. The bracket is easily attached to the barricade cross-member, and can be secured rigidly. Flags can be inserted into each side of the sign holder and interchangeable signs can be inserted into the sign holder.

COMING EVENTS IN THE GAS DISTRIBUTION INDUSTRY

October

5- 7 A.G.A. annual convention, Conrad Hilton Hotel, Chicago, Illinois.
13-14 Seventh Annual Gas Measurement Institute, National Guard Armory, Liberal, Kansas.
14-16 Wisconsin Utilities Association, operating and sales convention, Shroeder Hotel, Milwaukee, Wisconsin.
16 NGAA, southern regional, Carlton Hotel, Tyler, Texas.
21 NEGA operating division, Statler Hilton, Hartford, Connecticut.
22 NEGA accounting division, Statler Hilton, Hartford, Connecticut.
23 Oklahoma Utilities Association, accounting section, Jens-Marie Hotel, Ponca City, Oklahoma.
26-27 INGAA, annual meeting, Westward Ho, Phoenix, Arizona.
28-29 Computer Applications Symposium, sponsored by Armour Research Foundation, Morrison Hotel, Chicago, Illinois.
30-Nov. 1 American Society of Heating, Refrigerating & Air Conditioning Engineers, semi-annual meeting, Traymore Hotel, Atlantic City, New Jersey.

November

2- 5 11th Exposition of the Air Conditioning & Refrigeration Industry, Convention Hall, Atlantic City, New Jersey.
2-6 National Hotel Exposition (44th) The Coliseum, New York City. (A.G.A. will exhibit.)
9-11 API, 39th annual meeting, Conrad Hilton Hotel, Chicago, Illinois.
9-13 National Electrical Manufacturers Association, annual meeting, Traymore Hotel, Atlantic City, New Jersey.
20 NGAA, Panhandle Plains regional, Herring Hotel, Amarillo, Texas.
29-Dec. 4 ASME annual meeting, Chalfonte Haddon Hall, Atlantic City, New Jersey.

January 1960

20 NEGA, operating division, Sheraton Plaza, Boston, Massachusetts.
22 Oklahoma Utilities Association, accounting section, Tulsa, Oklahoma.
28 NEGA, accounting division, Statler Hilton, Boston, Massachusetts.

February 1960

1- 4 American Society of Heating Refrigerating & Air Conditioning Engineers, semi-annual meeting, Memorial Auditorium, Dallas, Texas.
1- 5 ISA instrument-automation conference, Houston, Texas.
29-Mar. 2 A.G.A. general management section conference, Pittsburgh-Hilton Hotel, Pittsburgh, Pennsylvania.

March 1960

14-18 National Association of Corrosion Engineers, annual convention, Dallas, Texas.
21-23 Mid-West Gas Association, annual meeting and convention, Hotel St. Paul, St. Paul, Minnesota.
23 Oklahoma Utilities Association, accounting section, Biltmore Hotel, Oklahoma City, Oklahoma.
24-25 Oklahoma Utilities Association, annual convention, Biltmore Hotel, Oklahoma City, Oklahoma.

Double-duty PAYLOADER®

with the Superior Side Boom

Even seasoned contractors are amazed at the variety of work this tractor-shovel handles when equipped with exclusive Superior-Hough side-boom attachment. It combines rubber-tired mobility with light crane lifting capacity.

Being *side* mounted, boom operation does not interfere with bucket operation. Either boom or shovel work can be handled at will. No time lost to change attachments. Hydraulic operated boom telescopes from 10 to 16 feet, lifts up to 10,000 lbs.; bucket carry capacity is 9,000 lbs.

What's more, this "PAYLOADER" handles easily (power-shift transmission, power-steering) travels fast (up to 24 mph) to work profitably on widely scattered job locations in one day.

Write for more information on this versatile boom and other useful "PAYLOADER" attachments, and ask about "Hough Purchase and Lease Plans" too.

AS A SIDE BOOM, rubber-tired "PAYLOADER" strings pipe along trench, can lift, carry and spot heavy equipment, pull sheeting, work on curbs and sidewalks without damage.

AS A TRACTOR-SHOVEL, "PAYLOADER" backfills trenches, can clear and grade right-of-way, load excess spoil and do other materials handling jobs . . . all with boom secured to machine.

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BULLETIN BOARD

CATALOGS – BROCHURES – TECHNICAL DATA

1959-1960 CATALOG OF AUTOMATIC CONTROLS lists White-Rodgers Co.'s line of heating, refrigeration, and air conditioning controls; contains many new products including 10 new models of the "Silent Knight" series gas valves. Full specifications, plus a description of operation and general applications, are included in each product listing. The 56-page catalog is cross-indexed for easy location of controls by type or use.

CIRCLE (61) ON THE REPLY CARD

DESCRIPTIVE DATA on Chemtrol's new dry tape material for "doping" pipe threads is now available. Tape is available in ½-in. widths, 300 inches of tape to a roll. Chemically inert, non-toxic, tape is made of Dupont's Teflon, and possesses remarkable resistance to heat and cold. Material does not dry out, effectively seals and lubricates joints in all pipe materials — metal or plastic. Eliminates galling, seizing, or rusting-in of connections. Plasticity, retained throughout life, readily seals off clearance between pipe threads.

CIRCLE (62) ON THE REPLY CARD

PROTECTION CONTROLS. New 4-page bulletin describes the "Protectofier" combustion safeguard control for heating and heat-treating applications. Units provide continuous protection against fires or explosions from build-up of combustible fuel mixtures in either single or multi-burner installations. Among new features described are the compact plug-in flame detector units that contain an entire electronic circuit, and a new "telefier" combustion safeguard indicator system that reduces downtime by providing direct-reading numerical display of faulty burner position if a flame failure occurs.

CIRCLE (63) ON THE REPLY CARD

FEATURES AND ADVANTAGES of line pipe manufactured by the electric-weld method are presented in a colorful 12-page booklet now available from Jones & Laughlin Steel Corp. Production operations used in making electric-weld line pipe are described and a complete table of specifications is included.

CIRCLE (64) ON THE REPLY CARD

DETAILS ON "PACKAGED PIPELINES" program recently announced by Southern Pipe, Division of U. S. Industries, are given in a new 6-page brochure. Six steps of the plan are described—study and application of customer specifications, scheduling for pipe mill production, cutting of pipe to exact lengths required, coating (and internal lining) to customer specifications, warehousing of pipe until required for delivery, and job-site delivery of pipe when and as required. Brochure gives specifications on Southern Pipe's "Lite-Wall" pipe, produced to API standards, in sizes 3 through 14-in., and describes the firm's facilities.

CIRCLE (65) ON THE REPLY CARD

AUTO FLEET LEASING for salesmen in cities and over-the-road is analyzed in new study just published by the Foundation for Management Research. The 24-page study includes full charts analyzing costs involved in different fleet plans, and is based on records covering 29,264 autos. Report is entitled, "Advantages and Disadvantages of Auto Fleet Leasing: A Comparison of Company Ownership, Salesman Ownership, and Leasing." Single free copies available.

CIRCLE (66) ON THE REPLY CARD

SERVICE MANUAL on air compressors and spray equipment — 1959-1960 edition — is now available from The DeVilbiss Company of Toledo, Ohio. New 400-page manual contains parts list, general information on installation, operation, and maintenance as well as other service information. Priced at $2.50.

CIRCLE (67) ON THE REPLY CARD

ONE-MAN HINGED CLOSURES with built-in safety features for low, medium, and high pressure service are described in new brochure from Tube Turns Division of Chemetron Corp. Photographs illustrate one-weld installation, easy maintenance, and one-man operation of new product. Charts give dimensional specifications, and cross sectional drawings describe design features. Closures are produced in sizes from 2 through 42-in. for ASA 150, 300, and 600 lb service; larger sizes and other pressure classes available on special order.

CIRCLE (68) ON THE REPLY CARD

PLASTIC PIPE APPLICATIONS. New 6-page, two-color brochure describes Southwestern Plastic Pipe Company products and their applications in the gas industry. Includes data on PVC, ABS, and polyethylene types of plastic pipe and various types of fittings.

CIRCLE (69) ON THE REPLY CARD

SKY CLIMBER UNITS for use by utilities and contractors when painting gas holders, storage tanks, and large buildings are described in new 4-page bulletin from Western Gear Corp. Data included on manual, air-powered, or electric-powered units. Applications range from use on swing stage, bosum chair, to the basket when one or more men and extra equipment must be raised or lowered. Photographs included.

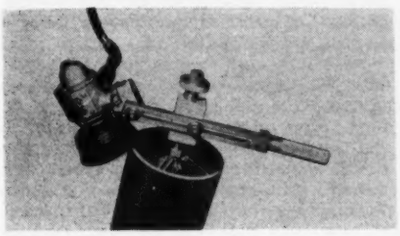
CIRCLE (70) ON THE REPLY CARD

RELIANCE DIFFERENTIAL-OPERATED TRIP VALVES PRESSURE REGULATORS are subjects of 2 new bulletins recently published by American Meter Company. The pressure regulator, a semi-balanced, single-seat, angle-type regulator for reducing applications, is described in bulletin 124. Designed to give trouble-free service under severe conditions, unit will handle gas having a high solids content, withstand temperatures from minus 60 F to 180 F, and has a maximum inlet pressure of 3000 psi. Bulletin 170 describes the Type 196 differential-operated trip valve that is designed for use at regulator stations to isolate line breaks. The cast bronze, manual reset, snap-action valve operator is tripped by a differential pressure taken from an orifice or valve, has a maximum working pressure of 1000 psi.

CIRCLE (71) ON THE REPLY CARD

AMERICAN METER COMPANY'S new bulletin provides detailed information on their threaded, slip-on and welding neck orifice flanges. Specifications on welding neck orifice flanges are given for both raised face and ring joint models. American produces orifice flanges in 250, 300, 600, 900, and 1500 lb pressure ratings.

CIRCLE (72) ON THE REPLY CARD



BEV-L-GRINDER designed to make on-the-job, "machine shop" accurate weld bevel preparation on 6 to 18-in. pipe is described in new literature from The E. H. Wachs Company. Grinder head can be set 20, 37½, and 90 deg by a locking pin in motor support. Cutting action is fast, accurate, and easy to control. Operator rotates grinder head around a self-centering spindle. Guarded 6-in. cupped grinding wheel is powered by 6000 rpm air motor.

CIRCLE (73) ON THE REPLY CARD

NATURAL GAS REGULATORS for stationary engines are described in new brochure from Beam Products Mfg. Company of Los Angeles. Horsepower ranges from 35 to 200. Detailed specifications are given and applications illustrated.

CIRCLE (74) ON THE REPLY CARD

SCHIELD BANTAM COMPANY'S self-propelled 11-ton crane-excavator is described in new 12-page, two-color bulletin. Standard and optional feature of the Model CR-350 upper unit including heavy duty drum shaft and swing assembly, all new heavy duty turntable design, three types of boom hoists, and automotive type steering are covered in 4 pages. Applications of unit are amply illustrated and described.

CIRCLE (75) ON THE REPLY CARD

ROCKWELL "GAS DRIVE," a completely self-contained air or gas-powered instrument drive and timing unit, is described in new 4-page bulletin from Rockwell Manufacturing Company. Descriptions of the applications and operation are supplemented by photographs and schematic drawings.

CIRCLE (76) ON THE REPLY CARD

"PRODUCTS FOR THE CONSTRUCTION INDUSTRY," LeRoi Division, Westinghouse Air Brake Company's popular 8-page bulletin, has been revised and reprinted. Several new photographs and additional information on the LeRoi line of rotary and piston type portable air compressors, combination tractor-air compressor, and air tools are included in new edition.

CIRCLE (77) ON THE REPLY CARD

HYPRESPHERE full-opening, lubricated spherical plug valves are described in new 10-page, photo-illustrated bulletin from Rockwell Manufacturing Company. Detailed drawings, specifications, and dimensions for each size in the new line — 16, 20, 24, and 30-in.— are included.

CIRCLE (78) ON THE REPLY CARD

SALES AID KIT ON HYDRONICS available from Permaglas division of A. O. Smith Corp. provides literature and display tools on "wet heat" and describes how it can compete effectively with other means of house heating. Included are a 4-color consumer brochure on hydronics; 4-color consumer bulletin on Permaglas' new home boiler line; stuffers to match these 2 pieces; technical specification sheet covering inputs, outputs, and sizing; two post cards; three radio scripts; eight advertising mats; special publicity material, and folder outlining special dealer aids such as boiler displays, literature rack, builder's sign, and a heat loss slide rule.

CIRCLE (79) ON THE REPLY CARD

"FACTS ON THE NEW IPSEN HEAT TREATING UNITS," new 6-page technical bulletin from Ipsen Industries, Inc., gives detailed construction and performance facts on equipment operating at temperatures up to 2000 F. Eleven cross section drawings, photographs, and specification tables illustrate automatic heat treating units that are designed for carburizing, carbon restoration, neutral hardening, marquenching, normalizing, annealing, and brazing.

CIRCLE (80) ON THE REPLY CARD

"COMPRESSED AIR FUNDAMENTALS," Ingersoll-Rand Company's new booklet, has been produced to assist in the selection of small "packaged" air compressors for industrial applications. Basically, booklet describes compressed air, how it is compressed, single- and two-stage compressors, piston displacement, actual delivery, unloading of compressors, regulation, and types of control used. Tabular and chart information on cu ft of air required to operate variety of pneumatic equipment is also included.

CIRCLE (81) ON THE REPLY CARD

ORIFICE PLATES, SEALING UNITS, AND RING-TYPE JOINT PLATE HOLDERS are described in new 8-page catalog section from Daniel Orifice Fitting Co. Universal size orifice plates for use in Daniel orifice fittings, paddle type orifice flange plates, and plates for Daniel flow sections are described as well as three sealing units. Complete information on design, sizes, ASA pressure ratings, and materials are included.

CIRCLE (82) ON THE REPLY CARD

"Surely you heard about the big revival of gas lamps?"

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ALUMINUMCASE METERS

LIGHT WEIGHT AND RUGGED

Precision-built AL-175 Aluminumcase meters are unequalled for dependable, economical domestic service. American's quality features assure maximum accuracy from pilot load to full rated capacity. And these light weight A.G.A. Class 175 meters provide important economies in shipping, handling and setting costs.

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- Vented, plastic index box.
- Rated capacity 175 cfh of 0.60 sp. gr. gas at ½-inch w. c. differential. Working pressure 5 psi.

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INCORPORATED (ESTABLISHED 1836)

General Offices: Philadelphia 16, Pa.
Sales Offices in Principal Cities

BOOKSHELF

Performance of Commercial Gas Cleaning Equipment, *published by the American Gas Association, 420 Lexington Avenue, New York 17, New York. Pages, 63. Price, $2.*

Results of industry-sponsored research project provides a foundation for design and development of more efficient gas cleaners. Studies conducted under the PAR Program determined cleaning efficiencies, oil losses, pressure drops, and dust loading characteristics of six gas cleaning units now on the market. Equipment evaluated included a filter cleaner, a centrifugal separator, and four oil-bath scrubbers. Pressure drops and cleaning efficiencies were established for each unit, and oil losses determined for the oil-bath cleaners. Gas throughput rates were varied from approximately 50 percent to at least 125 percent of manufacturers' ratings to determine effect of flow rates on operating factors.

Branch Connections Report 2: Survey of Research, *published by American Gas Association, 420 Lexington Avenue, New York 17, New York. Pages, 78. Price, $2.*

Recommendations for elimination of high stresses in gas pipeline branch connections are outlined in new engineering report compiled by Battelle Memorial Institute for the A.G.A.'s Pipeline Research Committee. Available data from published and unpublished works has been summarized to determine present level of knowledge concerning gas distribution and transmission branch connections research. Experimental stress analyses of more than 70 connections are reviewed.

A.G.A. Gas Heating Controls Service Manual, *published by the American Gas Association, 420 Lexington Avenue, New York 17, New York. Pages 400 (supplements issued three times per year). Price, $5.50: Subscription for 3-year Supplemental Service, $4.00.*

New authoritative handbook for servicing of controls on gas central heating equipment and gas space heaters is designed for on-the-job use by plumbing and heating contractors, gas company service departments, and any others concerned with adjusting, maintaining, or repairing gas house-heating equipment. Manual was prepared as project of Joint Committee on Gas Appliance Service Manuals of the A.G.A. and the Gas Appliance Manufacturers Association. Text and illustrations were supplied by control manufacturers who also reviewed manual to verify accuracy and authenticity.

American Welding Society Training Manual of Arc Welding, *published by The American Welding Society, 33 West 39th Street, New York 18, New York. Price, $3.*

Specifically designed for welders and instructors of manual metal-arc welding, the AWS manual includes welding processes and recommended safety practices, the metal-arc process, accessories, exercises in arc welding, arc welding equipment, identification of metals, and metals and their structure. Profusely illustrated, manual contains 337 line drawings, halftones, and tables. Fifty pages are devoted to arc welding exercises. Step-by-step illustrations show how each operation is performed, and each exercise details the material, electrode, amperage, voltage, polarity, and the purpose of the particular exercise.

Corporate Records Retention, A Guide to U. S. Federal Requirements, *Vol. 1, prepared by Robert B. Wheelan, and published by Controllership Foundation, Inc., Two Park Avenue, New York 16, New York. Pages, 221. Price, $10.*

Varying lengths of time records must be kept in regard to income and excise taxes, social security, payrolls, etc., have been tabulated in Volume 1 of a new series entitled, "Corporate Records Retention." General requirements of the Internal Revenue Service, Labor Department, and the Securities and Exchange Commission, plus other agencies and departments concerned with government contracts, are listed for natural gas, petroleum, pipeline, public utility companies and others. Report also indicates in which cases, and under what conditions, microfilms may be retained in lieu of original records.

Technical Editing, *edited by B. H. Weil, published by Reinhold Publishing Corporation, 430 Park Avenue, New York 22, New York. Pages, 278. Price, $5.75.*

Basic concepts and operating practices of internal communications, journal editing, book publishing, and graphic arts presentation for all technical fields are considered. More than a copy-reading manual, book deals with editing as a primary communications step, and relates the documents of all technical areas to the purpose of serving the reader. This is the first time every technical editing principle has been brought together in one place.

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Twelve chapters of proven ways to increase your effectiveness . . . including How to Think Creatively, How to Listen, How to Write Superior Letters and Reports.

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Newly revised and expanded special issue of the American Gas Journal devoted to approximately 250 tables, formulas, graphs and diagrams indexed for reference to problems involving gas distribution and transmission.

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THE MAGAZINE OF THE GAS DISTRIBUTION INDUSTRY

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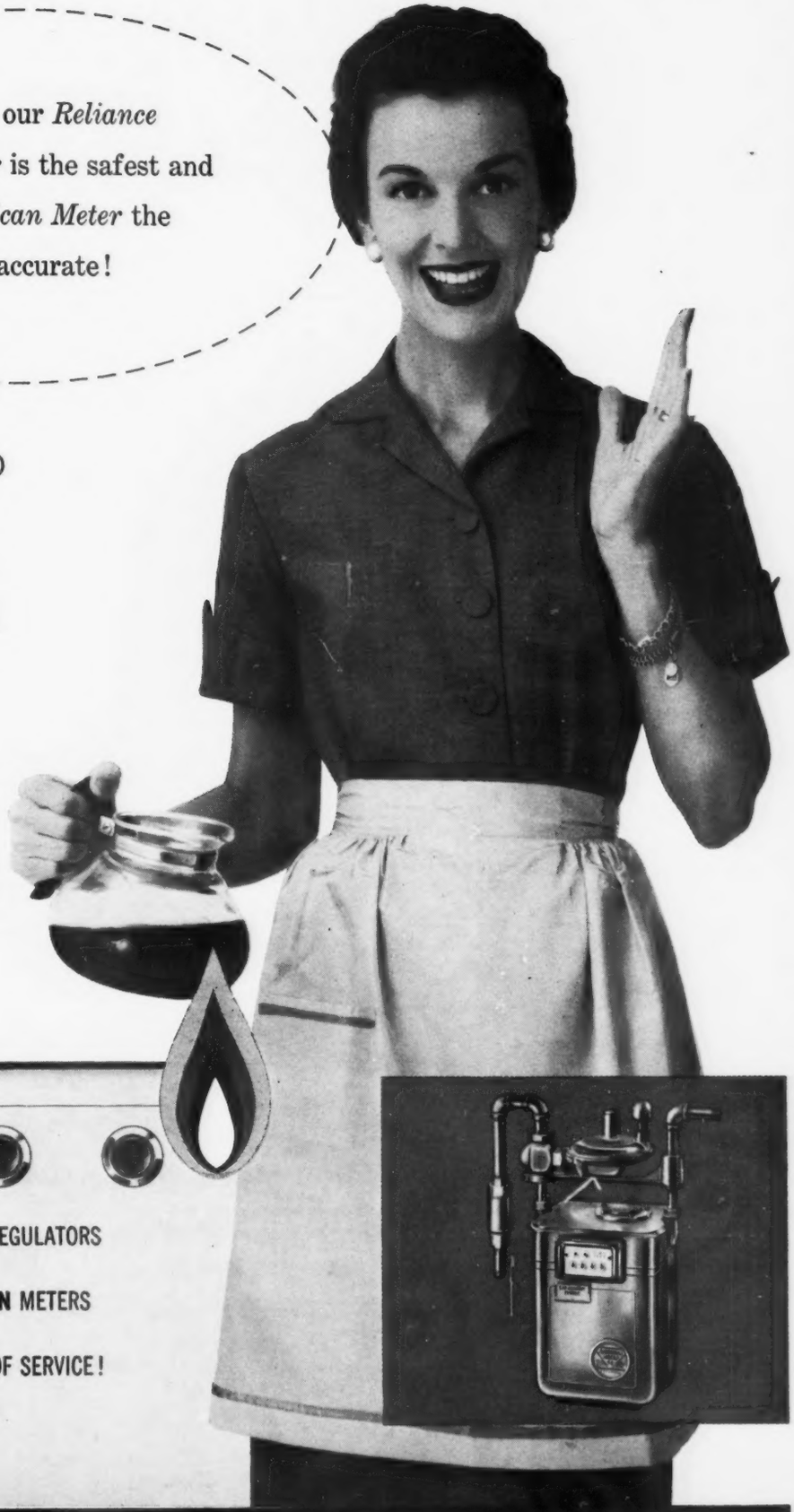

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American Meter and Reliance have pioneered in the development of today's advancements in *measurement* and *control* technology. Ask our representative in your area how the American and Reliance complete line of precision equipment can help solve your measurement and control problems.

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Write for bulletins containing complete specifications.

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INCORPORATED (ESTABLISHED 1836)

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MEASUREMENT ENGINEERS

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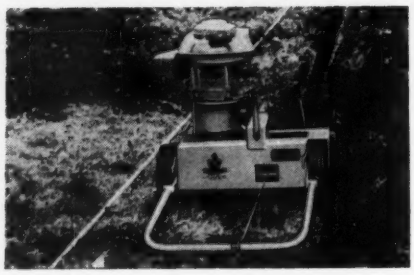
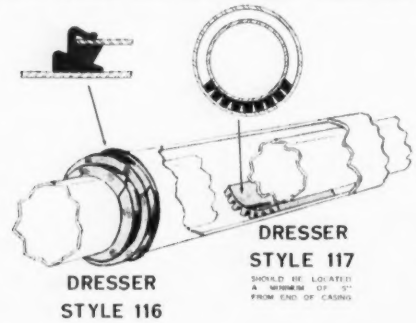


SERVICE LINE TRENCHER. Self-propelled "Pup Trencher" manufactured by Davis Manufacturing Inc. can virtually dig a service line—either 2 or 3-inches wide—by itself. Once started, unit can be set at a desired depth, down to 3-ft, and left unattended for the most part until it finishes the trench. Propulsion is provided by a winching mechanism with a six-speed drive. Unit leaves surrounding turf undamaged because it delivers minimum of spoil.

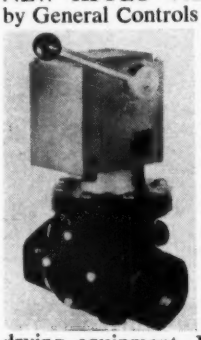
CIRCLE (1) ON THE REPLY CARD

A CASING INSULATING SEAL AND A CASING CRADLE are two new products recently introduced by Dresser Manufacturing Division, one of the Dresser Industries. Insulating seal provides both effective sealing and insulation of the casing ends; a dual role accomplished by a unique "double gasket," which hooks over casing end and extends inside the casing. Wedge-shaped carrier gasket, which fits around the carrier pipe, is driven into position against the casing gasket. The all-rubber seal completely fills the annular space between pipe and casing, providing 100 percent seal even though casing or carrier pipe may be out-of-round or flat in places. New style casing cradle, also multi-purpose, provides both permanent insulation and support between carrier pipe and casing while centering carrier pipe in the casing. Cradle has ample strength to support pipe and backfill load without being crushed or deformed by the tremendous weights involved. Cradles are constructed of a maximum number of hard rubber skids bounded to a pliable rubber impregnated fabric sheet; are flexible yet have great strength, and their maximum load bearing surfaces protect pipe coating and prevent cold flow. Both seals and casing cradles are available in sizes 6 through 36-in.

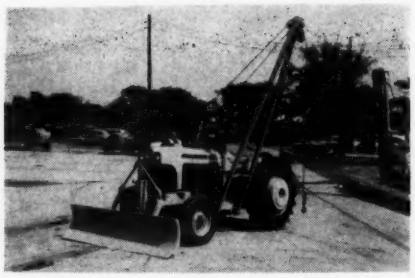


CIRCLE (2) ON THE REPLY CARD

NEW HI-FLO VALVES manufactured by General Controls of Glendale, California, utilizes straight-through non-turbulent flow with a fast-acting, fail-safe shutoff, and are designed for use as on-off control and safety shutoff for industrial gas-fired application such as boilers, heat treating furnaces, paint drying booths, baking ovens, and industrial drying equipment. Valve delivers up to 3 times greater flow for a given line size because the inner valve in the open position is completely withdrawn from the main gas stream, giving straight-through flow unobstructed by valve mechanism. Available with 2 types of actuators; one manually reset, the other electrically reset, for pipe sizes from 1 to 6-in.



CIRCLE (3) ON THE REPLY CARD

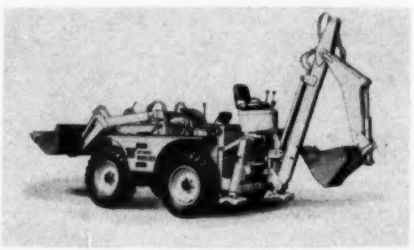


"LITTLE BOOMER" an all-hydraulic sideboom manufactured by Midwestern Manufacturing Company, is now available for mounting on Ford series 1800 industrial wheel-type tractors. Sideboom has a lifting capacity of 5000 lb. Mounted on Ford tractor, unit is especially adaptable to pipe laying work in urban areas. Features include simplified, all-hydraulic controls, two specially-designed winch drums in full view of the operator, and hydraulically extended counterweights. One thousand pounds of counterweights may be extended to provide increased stability and lifting capacity. Unit has a constant load control which prevents accidental dropping of the load.

CIRLCE (4) ON THE REPLY CARD

ACCURATE AND DEPENDABLE MEASUREMENTS from a measuring wheel that can be rolled over irregular and uneven terrain is now possible with Rolatape's new Model 415. New measuring wheel can be operated by one man, registers measurements to ½-in. on one side of the disc wheel, and tenths of a foot on the other. Has a wide neoprene tire that provides positive traction under all conditions; is equipped with automatic brake and a built-in stand. Measures up to 100,000 ft (almost 19 miles).

CIRCLE (5) ON THE REPLY CARD



OTTAWA STEEL DIVISION has announced a new unit-designed, self-propelled backhoe and loader. Called "the Marauder," unit is not a tractor with attachments, but an integral digging-and-loading unit. A 4-wheel drive prime-mover is capable of speeds from 0 to 25 mph. Backhoe is an integral part of the prime-mover, and incorporates Ottawa welded design, turret-type seat that pivots with boom, rugged A-frame that supports outriggers, boom structure and swing mechanism, reverse-mounted cylinders for protection of highly polished rams, simple two-lever controls, and a wide range of bucket types and sizes.

CIRCLE (6) ON THE REPLY CARD

The MINIATURIZED-PRECISION WILKINSON Line Locator Model W-3

This radically new, super-powered, transistorized instrument weighs only four pounds and is one-fourth the size of conventional pipe locators.

It is as handy as a flashlight; the maintenance is trivial; the non-leak miniature batteries last ten times longer. Long-life transistors eliminate replacement. Molded glass fibre cases. Transistor ear set. Telescopic aluminum handle. Etches circuitry and unique antenna. Contained in carrying case.

WILKINSON PRODUCTS COMPANY

3987 Chevy Chase Drive • Pasadena 3, California • SYlvan 0-4314

X-RAY INSPECTION of pipe sections and "window welds" is more easily accomplished with General Electric's new lightweight, portable LX-140 X-ray equipment. Control unit weighs only 25 lb; X-ray unit itself only 46-¼ lb. Continuous range of 70 to 140 kvp is available. Radiographs with 2 percent sensitivity and 1.5 density can be produced with 1-½ minute exposure through 1¼-in. steel. Unit will operate in temperatures ranging from 0 to 120 F, humidity up to 95 percent and altitudes up to 5000 ft.

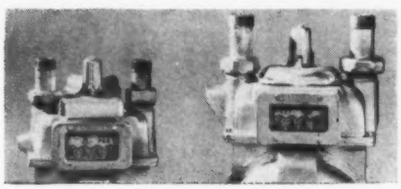
CIRCLE (7) ON THE REPLY CARD

ELLISON DRAFT GAGE COMPANY has introduced a highly practical flow tube meter designed for measuring the flow of gas. Gages employing either mercury or oil are available in 10, 12, 20, or 30-in. scales. Needle valve equalizer fittings are available with flow meters for differential static pressures above scale range. Orifice flanges with adjustable orifice plates are also available for use with flow meters.

CIRCLE (8) ON THE REPLY CARD

REMOTE TYPE GAS-FIRED AIR CONDITIONING UNIT has been introduced by Payne Company. Test models in service for the past year in various parts of the country have proved highly satisfactory. Called Miracool Air Conditioner, unit is an air cooled absorption refrigerated unit that supplies chilled water to the cooling coil. Can be adapted for use with companion Upflow, Downflow, or Horizontal Payne furnace installations for complete year around gas-fired air conditioning.

CIRCLE (9) ON THE REPLY CARD



UNIVERSAL INSULATING METER NUTS of special size and design are now available for use on Sprague No. 1A and No. 2 combination meters and regulators. Previously, the insulating nut usable on the No. 1A meter would only interfere with regulator spring case or cover of the combination meter, thus preventing its use. New design eliminates this. Illustration shows types 1A and 2 combination meters fitted with Type 2526C and Type 2528 insulating nuts, which are used on meter outlets because regulator orifice is used in the inlet swivel.

CIRCLE (10) ON THE REPLY CARD

NEW ALL-PURPOSE BODY for 1-ton trucks, designed specifically for jobs too heavy to handle by hand and too light to handle economically with 1½ and 2-ton trucks, is now being marketed by Leland Equipment Company. A smaller version of the Leland "Packaged Unit," new body has 2-in. center matched hardwood floor with deck plate covering rear portion and a bolster pin hole. Toggle bar is placed at the tail roller for gin pole work. Winch mounting brackets, body mounting brackets, clearance lights, reflectors, and tool box are standard equipment. Body length from front to tail roller is 8 ft; length behind the winch is 6 ft 4-in. Width is 90 inches; overall weight, 1620 lb.

CIRCLE (11) ON THE REPLY CARD

ANGLING BLADE BULLDOZERS for all models of Caterpillar-built Traxcavators, designed for greater maneuverability, better operation in restricted areas, and increased visibility for the operator, are now available from Balderson, Inc. New dozers are engineered to match width, power, and traction for the Traxcavator, and may be angled right or left, or used in straight position for complete versatility. Blades are quickly interchangeable with Traxcavator buckets either front or side delivery.

CIRCLE (12) ON THE REPLY CARD

ELIMINATE COSTLY LUBRICATED PLUG VALVES

REPLACE THEM WITH...

the PLUGAROO NON-LUBRICATED PLUG VALVE

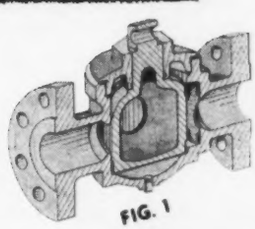


FIG. 1

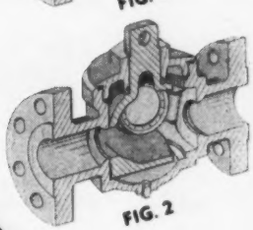


FIG. 2

The PLUGAROO combination Plug and Check Valve eliminates expensive lubricating equipment . . . reduces costly maintenance trips. Fig. 1—A quarter turn closes the plug against clapper for positive seal, yet wide tolerances prevent plug or valve-body gauling. Fig. 2—In "open" position, the 20° vertically hinged clapper seals under its own weight and the PLUGAROO operates as a Synthetic Seal Check Valve. Plug locking device is optional on your request. The PLUGAROO is available in semi-steel, steel, and aluminum-bronze thru series 90 (2160# W.P.—3250# Test). API, ASA dimensions for all standard end connections. For details, write:

Plugaroo prices are competitive to leading lubricated plug valves!

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125 W. FIRST • TULSA, OKLA. • LU 7-6731

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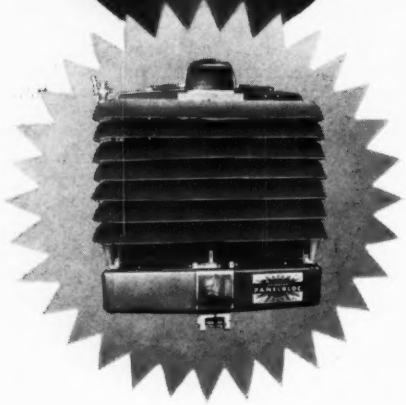

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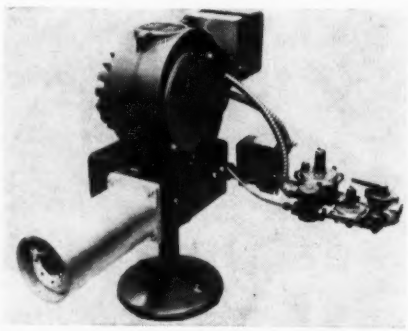
PANELBLOC DIVISION
The Bettcher Mfg. Corp.
3106 West 61 St., Cleveland, Ohio

AEROTRON HAS INTRODUCED a new VHF-FM 2-way radio that is designed for either mobile or base station use. Utilizing — for the first time in mobile radio — tubes and circuits perfected for use in TV and radar, the new model solves many mobile-radio problems of bulkiness, limited performance, high original costs, and excessive installation and maintenance expense. Chassis is no larger than 8½ x 11-in. and its smaller size makes it easier and cheaper to install. Unit receives loud and clear, rejects unwanted off-frequency signals through an exclusive filter of original design. Unit also features a cascode RF amplifier gated beam limiter, push-pull RF power amplifier, and several other technical innovations. Can be operated on any common power source — 6 or 12 v or 115 v a-c without modification. Temporary mobile installations in emergencies can be made in a matter of seconds with a cigarette lighter power plug and a clip-on antenna.
CIRLCE (13) ON THE REPLY CARD

UNIVERSAL CHEF BROILER features "floating control" of cast-iron grid. Slight pressure on front bar raises and lowers broiling rack when directly under flames, or when pulled all the way out. Springs and counterbalances insure smooth control. Floating grid is 27 by 31½ in., completely unobstructed and giving a usable broiling area of more than 852 sq in.
CIRCLE (14) ON THE REPLY CARD

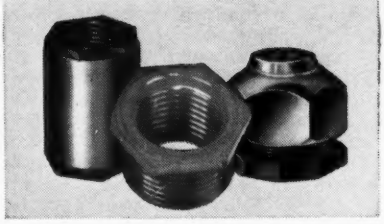


PACKAGED FAN-TYPE GAS BURNER, completely piped and wired and ready to install, has been introduced by Bryant Industrial. Unit is used on incinerators, ovens, air heaters, furnaces, and miscellaneous heating applications; features a nozzle-mix burner that does not require refractory combustion tunnel, and a blast pilot that will not blow out. Designated the Incino-Flame, unit employs simple, foolproof, field-tested, approved controls assuring low maintenance. Three control options are offered — manual, semi-automatic, and full automatic. Each burner is available in 2 capacity ranges — minimum of 50,000 and maximums of 450,000 or 600,000 Btu per hr. Units are available for all types of commercial fuel gases, including liquefied petroleum.
CIRCLE (15) ON THE REPLY CARD

PROTECT mains, meters, pipes, equipment, and appliances with

MAYCO

Dielectric Fittings or Dielectric Bushings



Stop electrolysis by insulating connections with MAYCO Dielectric Fittings or Dielectric Bushings. Bushings are toughest PLASKON nylon with extra-heavy "hex" gripping surface (on most sizes)...withstand pressures to 1000 lbs., temperatures to 300° F. Sizes to 2" for gas, plumbing, heating installations—wherever dissimilar metals are joined. Order from your jobber or write:

MAY PRODUCTS, INC.
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Manufacturers of MAYCO Dielectric Fittings — MAYCO Water Softeners

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Improved Paper
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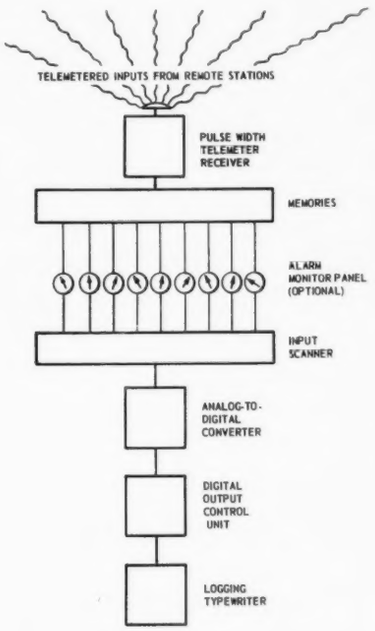
PRODUCT PARADE

CLOSED CIRCUIT INDUSTRIAL TELEVISION cameras and monitors are now available from Motorola, Inc. The basic general purpose camera, available in four versions is a high quality, highly sensitive and stable instrument, providing 550-600 lines horizontal resolution; weighs 12 lb, and measures 5½ by 7 by 11 inches. Puts out a 1 volt video signal into a 75 ohm coaxial cable; uses a standard 16 mm C lens mount and can accommodate remote control 4 lens turret. Camera is available with either locked, or random interlace, and either automatic, or manual light compensation. Monitor available in either the 14-inch or 21-inch model. Larger model can also receive regular off-the-air broadcast signals, and be used as an audio amplifier.

CIRCLE (16) ON THE REPLY CARD

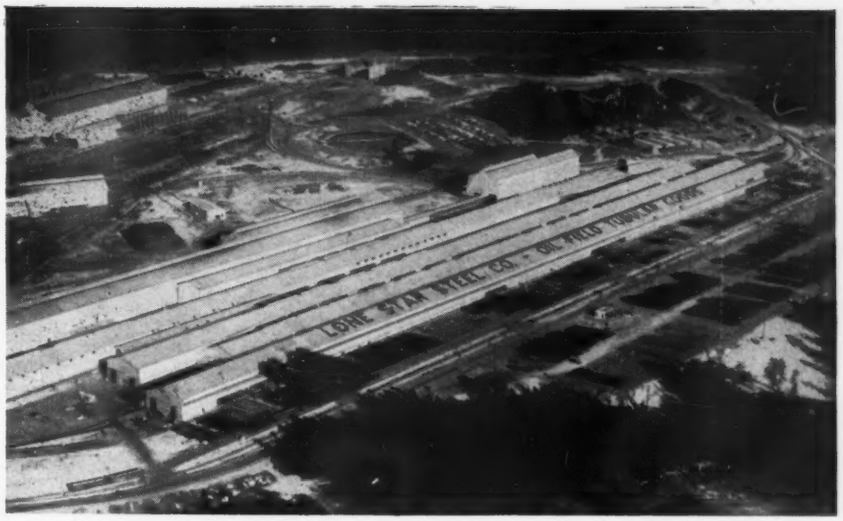


INTEGRATED INFORMATION SYSTEM for accurately measuring, transmitting, indicating, and recording — in digital form — flow, pressure, temperature, and other variables of flowing gases is now available from Fischer & Porter Company. System measures variables at remote points and relays data by means of standard communication or telemetering equipment to a central control station where it is converted into digital form and recorded by automatic typewriter. System features include a single transistorized analog-to-digital converter that converts and displays telemeter data continuously in digital form at the central controls station and a continuous alarm monitoring with adjustable high-low set points. Equipment can be adjusted to indicate variables directly in psi, degrees F or C, rpm, or cfm.

CIRCLE (17) ON THE REPLY CARD

NEW LINE OF COUPLINGS AND FITTINGS for joining grooved-end pipe has been announced by Dresser Manufacturing Division. Designed the "Kupl+Lok," new line presently includes couplings, ells, tees, reducers, and line caps. Available in 2 complete series—one for working pressures up to 500 psi, and another for working pressures to 1000 psi. Both series available with either grade 30 gaskets for general service, or grade 69 gaskets for oil and gasoline.

CIRCLE (18) ON THE REPLY CARD



Specify line pipe from Lone Star,
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Generally called America's most modern steel plant . . Lone Star is primarily dedicated to supplying Joe Roughneck's API casing, tubing and line pipe needs.

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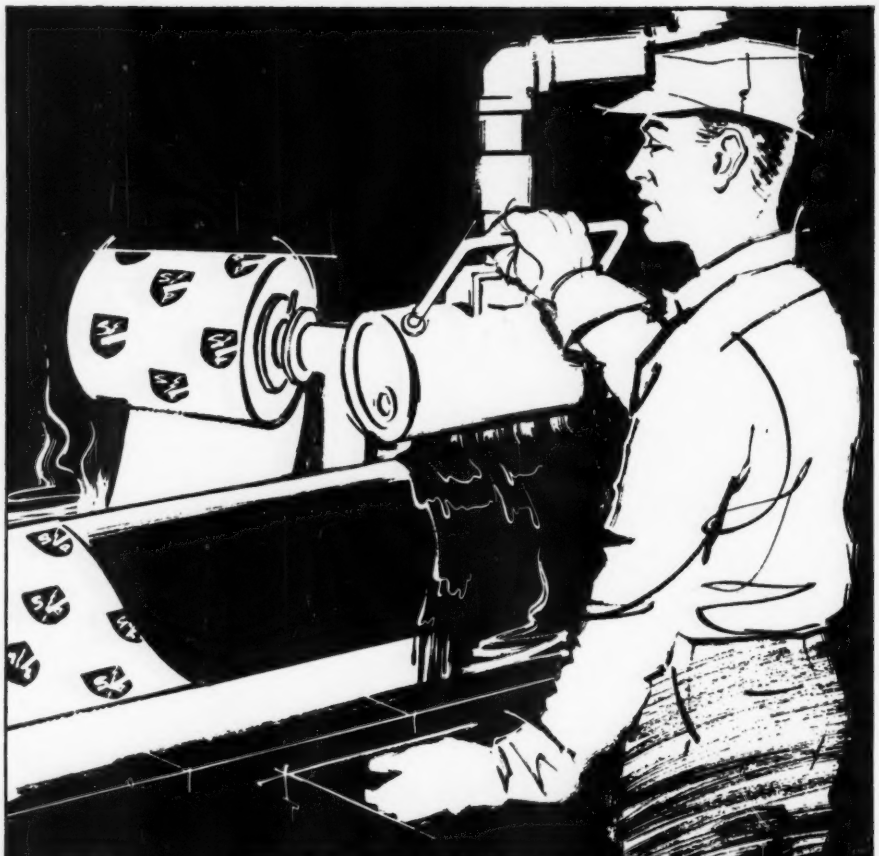

The PROVEN METHOD for PIPEPROTECTION

The essence of pipeprotection is a perfect bond of the coatings and wrappings to the pipe and to each other. This bond must be maintained under all conditions — when the pipe is bent and during wide temperature variations. Otherwise, the coatings and wrappings would slip and creep and holidays would occur, permitting corrosive action on the pipe.

There are no other materials, generally available today for pipeprotection, that furnish the perfect bond to steel pipe that is provided by bituminous enamels and felt and glass wrappings when applied according to the rigid Standard Specifications of Standard Pipeprotection Inc.

Use the proven method for pipeprotection by ordering your c w pipe from Standard Pipeprotection Inc.

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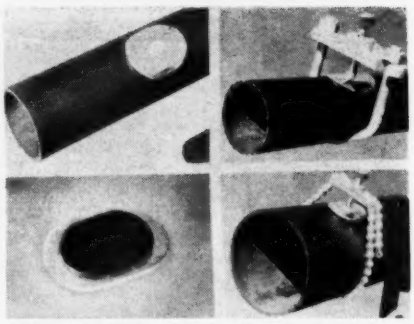
PRODUCT PARADE



PIPE PATCH. New efficient method of repairing small leaks in any fluid or gas line is now available through the industrial sales division of M. J. Crose Manufacturing Co., of Tulsa, Oklahoma. Patch permits users to stop leaks in pipe without shutting down the lines. Each patch, individually contoured to fit each size of pipe and furnished complete with bonded neoprene gasket, is placed directly over the leak, then held in place by "hold down" clamps of either the saddle type for ¾ through 6-in. pipe or the chain type for 7 through 36-in. pipe. When sufficient pressure is applied to the patch by the tool, the leak is immediately sealed off. Once sealed off, patch can be welded on the pipe for a permanent repair or left with the hold-down tool in place for a temporary repair. Tools may be reused indefinitely.

CIRCLE (19) ON THE REPLY CARD

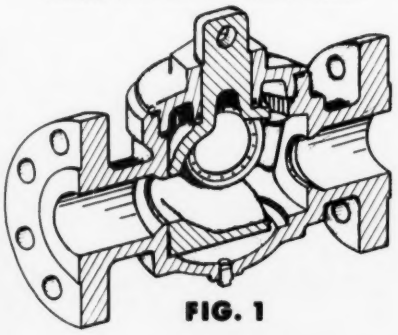


FIG. 1

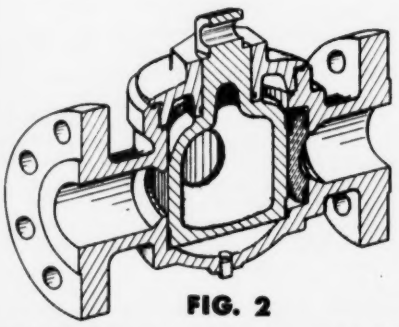


FIG. 2

"PLUGAROO," combination non-lubricated plug and check valve manufactured by Frank Wheatley Corporation of Tulsa, is available in semi-steel, steel, and aluminum bronze in 2 to 6 in. sizes with regular or full opening. Recently high grade semi-steel valve rated 175 w. p. to 350 lb test, with screwed or flanged ends, has been added to the line. All valves are available with either Teflon or synthetic rubber seals. In Fig. 1, the clapper is hinged vertically on a 20 deg angle. When plug is open, clapper closes with its own weight. In this position it operates as a check valve. Fig. 2 shows how a quarter turn easily closes the plug against the clapper sealing off the incoming product and converting the unit to an effective non-lubricated plug valve.

CIRCLE (20) ON THE REPLY CARD

CLEVELANDS STRETCH

BUDGET DOLLARS

longer work life

lower distribution costs
year after year

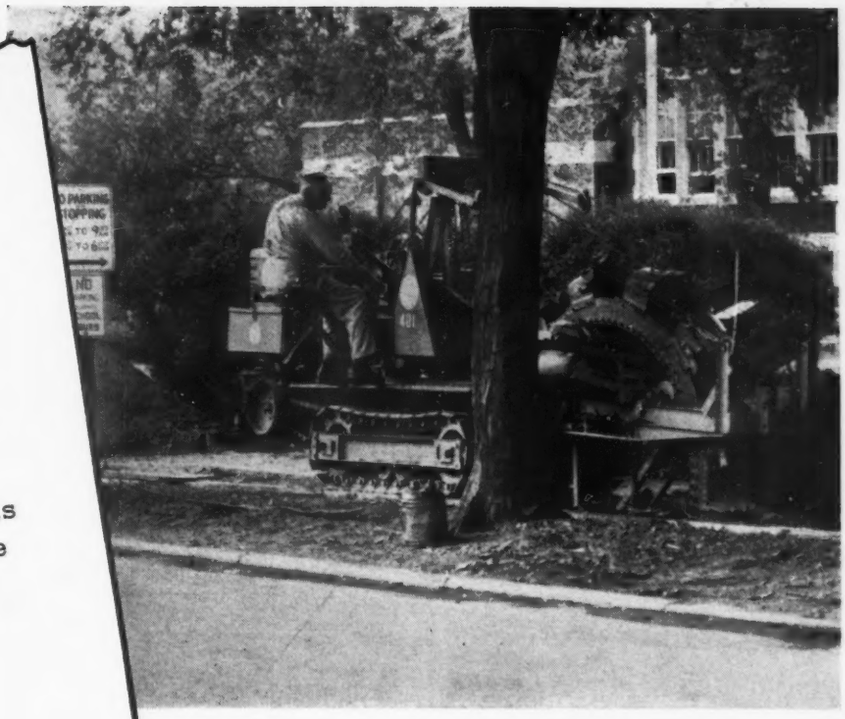
check latest improvements
on entire Cleveland line

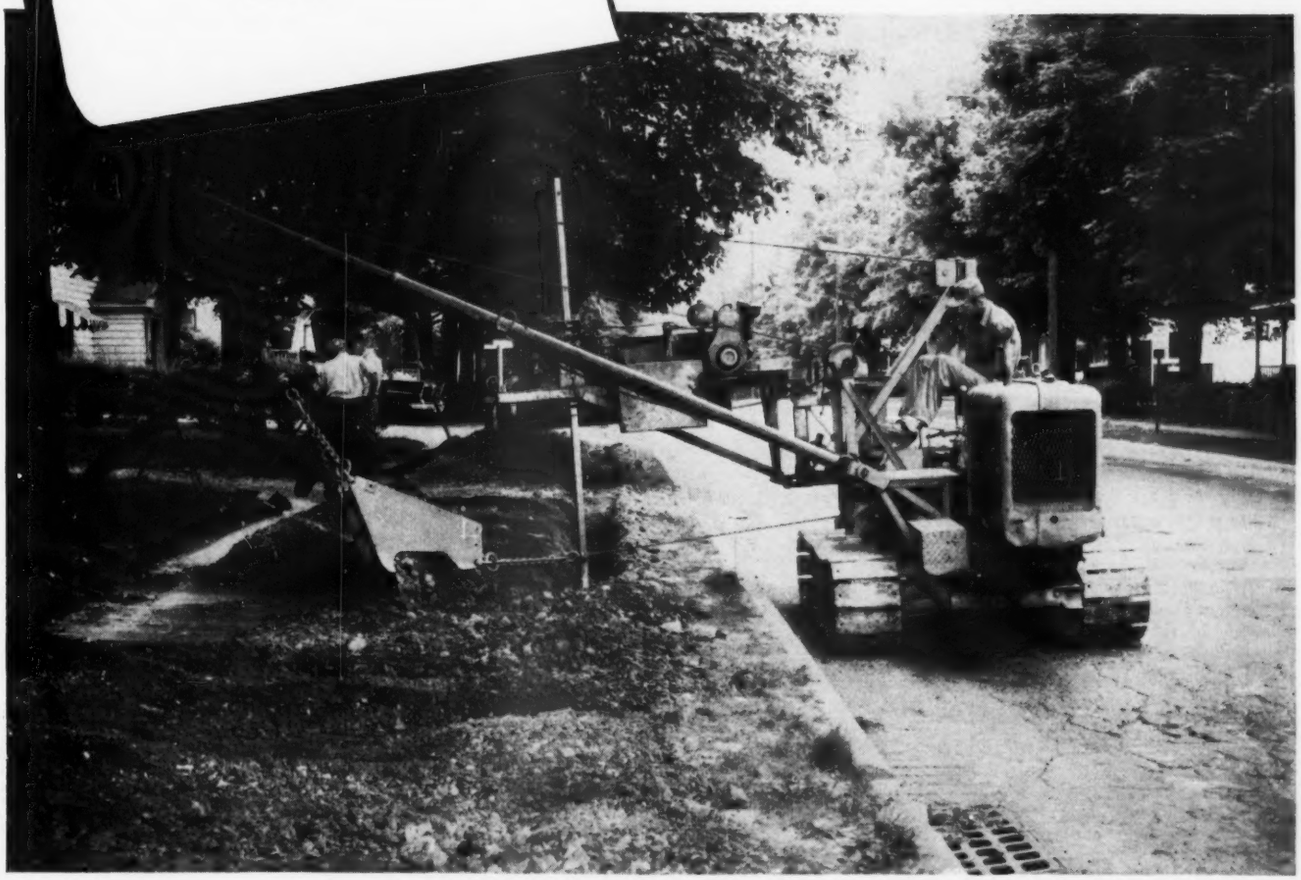
trenchers

backfillers

pipelayers

tampers





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SLASH
Trench Costs

Model M-3, 9 HP, Illustrated

Amazing Trenchers
MODELS: C-3, 7 HP • M-3, 9 or 12 HP

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Produces Low Cost Trench

. . . overall cost less than any other machine or method! Usually about 2¢ A FOOT

HOW IT'S BUILT: 7, 9 or 12 HP air cooled engine, 3-speed transmission, sealed ball bearings, 20M lb. test steel digging chain, replaceable teeth Studite edged, telescoping tubular steel boom, screw jack depth control —rugged throughout!

WHAT IT WILL DO: Trench at speeds up to 12 FPM, widths 3" to 12", depths 2' to 5', digs in any soil. Countless applications for utility service lines, gathering systems, signal systems, cathodic protection, street lighting, sprinkler systems, road crossings, etc.

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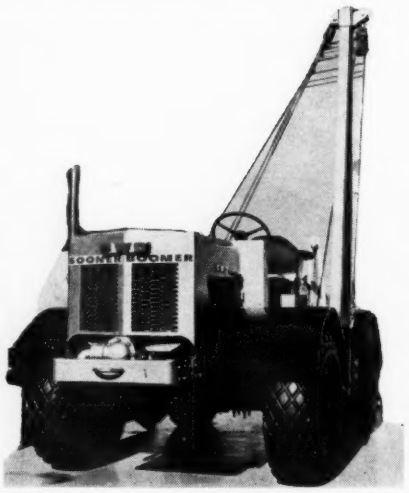
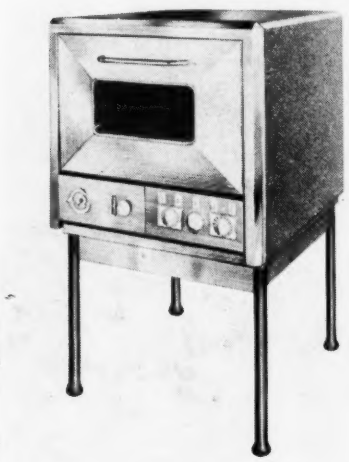


FWD's MODEL BX FOUR-WHEEL-DRIVE TRACTOR is now available with "Sooner Boomer" sideboom. Tractor unit has a 90-in. wheelbase, weighs only 15,000 lb, and features high traction, mobility, and maneuverability needed for gas line installation. The Sooner Boomer sideboom loader was designed especially for the FWD tractor and can lift 17,500 lb at a 4-ft radius. A hydraulically controlled counterweight maintains tractor stability under full boom load. Boom can be extended to 12 ft 6 in. An 80 by 36 in. backfill blade can be mounted on the front of the tractor; both boom and blade are hydraulically operated.

CIRCLE (22) ON THE REPLY CARD

KEATING OF CHICAGO, INC. has introduced a new "WIMCO" oven for the food service industry that, although considered small, has the capacity of baking 40 9-in. frozen pies in 45 minutes. Features include fan that drives air inside oven at a velocity of 55 mph creating a turbulence throughout the entire oven chamber and providing uniform temperature, patented thermostat that provides one temperature throughout the entire chamber; and a muffled oven so no moisture is allowed to escape from products being baked or roasted. Heat is transmitted purely by convection.



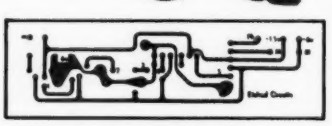
CIRCLE (23) ON THE REPLY CARD

The most effective PIPE LOCATOR in the world

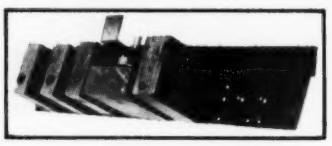
FIELD PROVED
the award winning
"Signalmaster"
TRANSISTORIZED
PIPE LOCATOR
MODEL TR-1A

Utility and Construction Companies, Municipalities are unanimous in agreeing that MODEL TR-1A has proved most effective for locating mains, services, valves, conduit, high voltage lines, telephone cables. Easily separates parallel lines and can be used to trace non-metallic pipe lines. Complete piping systems traced out.

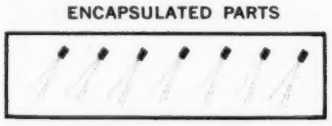
SPECIFICATIONS: Size of cases when clamped together: 9½" x 12½" x 5½" • Size of transmitter and receiver boxes, each: 9½" x 12½" x 2¾" • Operating weight, transmitter: 4½ lbs. • Operating weight, receiver: 4¾ lbs. • Circuit: Transmitter—one transistor, Receiver—six transistors • Batteries: Transmitter—4 size C flashlight cells, Receiver—4 size C flashlight cells • Switching: a. Automatic power switching for all "on-handle" operations. b. Automatic "turn-off" when set is not being used.



ETCHED CIRCUITRY



ENCAPSULATED PARTS



SEVEN TRANSISTORS

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Leading Electronic Manufacturers
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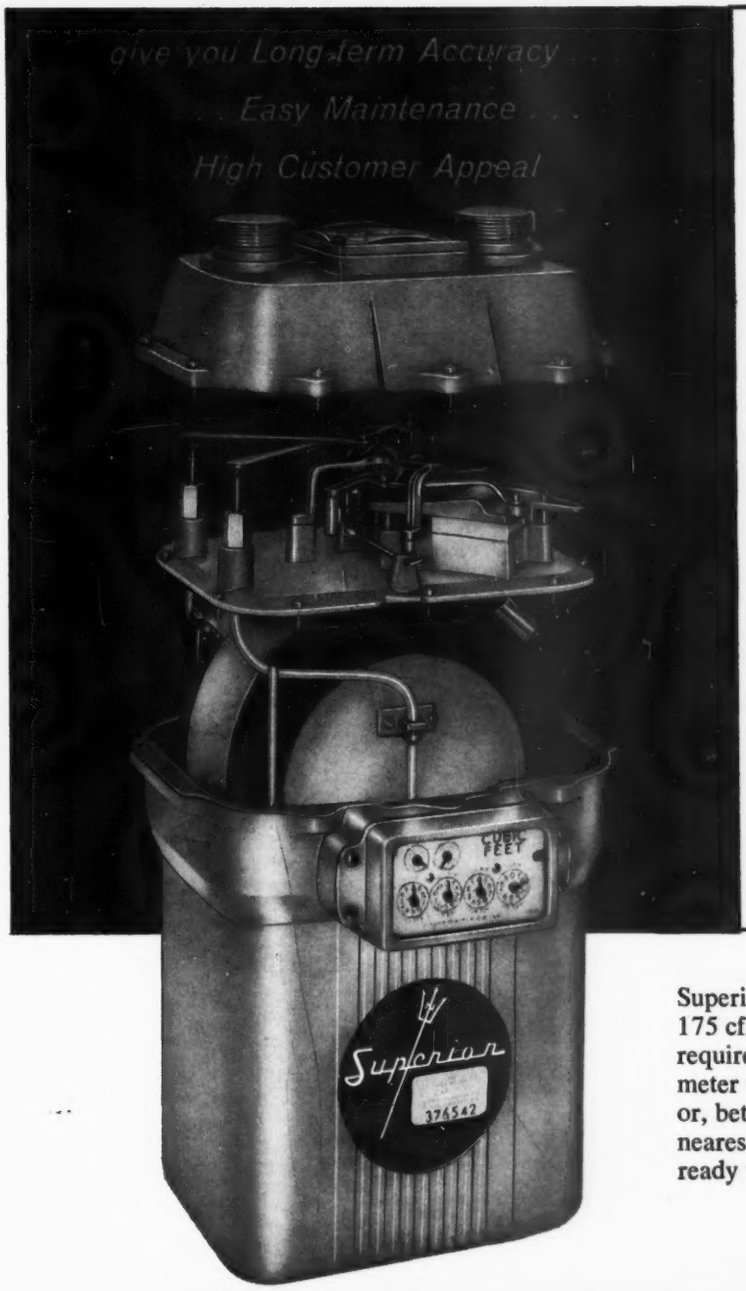
16 REASONS

SUPERIOR Aluminum Case METERS



1. **Slow movement...**
2. **Simple horizontal seam...easily sealed.**
3. **Accessible table...just remove the screws holding top.**
4. **Meter top removable without disturbing index box.**
5. **Valves readily accessible when top is removed.**
6. **Seam gasket stays resilient...**
7. **Entire mechanism lifts out with valve table.**
8. **Heavy-duty, sintered bronze bearings oil-impregnated for life.**
9. **Flag arrangement gives arm smooth operation and longer life.**
10. **Accurately-controlled diaphragm... no inaccuracies from deflection.**
11. **Cupped side flanges permit easy and safe carrying.**
12. **Calibration through convenient hand hole.**
13. **Broad base for conveyorized handling. Flats on top permit solid stacking.**
14. **Index removable without disturbing meter.**
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16. **Conforms to latest A.G.A. standardization specifications.**

Superior now manufactures aluminum case meters in 175 cfh, 250 cfh and 340 cfh sizes to meet most domestic requirements. To find out how this advanced-design meter will fit into your planning send for bulletin 1150... or, better still, phone the Superior representative nearest you. He understands your needs and stands ready to give you good, quick service.

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15

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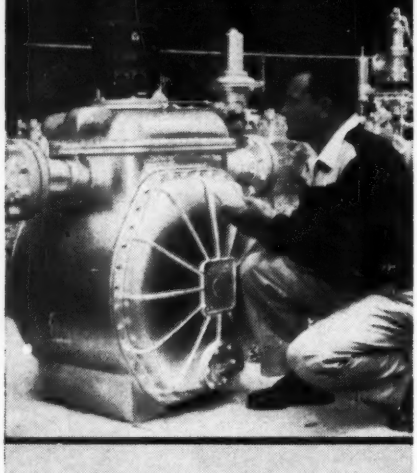
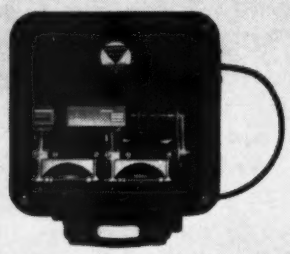
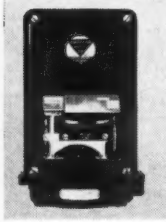
FLOW MEASUREMENT
365
DAYS A YEAR







USE AMERICAN® BASE VOLUME AND BASE PRESSURE INDEXES

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MEN AT WORK

IN THE GAS DISTRIBUTION INDUSTRY

J. S. Schuchert

T. H. Evans

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● Recent personnel changes and duty assignments in the sales department of Boston Gas Co. include: **Francis D. Hackett,** assistant manager, residential sales, is now in charge of the general sales office, appliance purchasing and inventory control, home service section school programs, prospect section and company exhibitions, in addition to previous responsibilities. **George C. Schmidt,** former director sales, has been named assistant manager, residential sales; **Michael M. McGoldrick,** former industrial sales engineer, has been made assistant manager, commercial industrial department, and is responsible for contracts and policies affecting architects, engineers, food service equipment dealers, and large commercial building construction; **Paul C. Connell,** former supervisor of heating sales section, has been appointed supervisor of newly-formed air conditioning and volume heating sales section. **John J. Queeney,** former staff assistant, becomes supervisor of the heating sales section.

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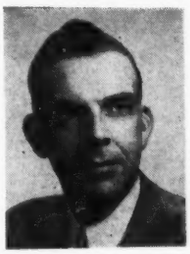

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● Commissioner **Frederick Stueck,** Republican from St. Louis, Missouri, has taken the oath of office for a second five-year term as a member of Federal Power Commission. President Eisenhower nominated him for his second term on May 5 and he was unanimously confirmed by the Senate of June 4. The new term expires June 22, 1964. Stueck was a former chairman of the Missouri Public Service Commission.

● **Miss Stella Kruizenga** has been named secretary of Michigan Gas Utilities Co. of Coldwater, Michigan, an office rarely achieved by a woman in a utility company. She joined the company in 1928 as a clerk.

● Northern Ontario Natural Gas Co., Toronto, has announced the appointment of **Alan D. Hall** as comptroller, **E. C. Bovey,** former assistant to the president, as vice president, and **A. Hove,** former chief engineer, as vice president and chief engineer. Hove will direct activities of the engineering and operations department. Bovey's new activities will include supervision of the financial departments, personnel, and public relations.

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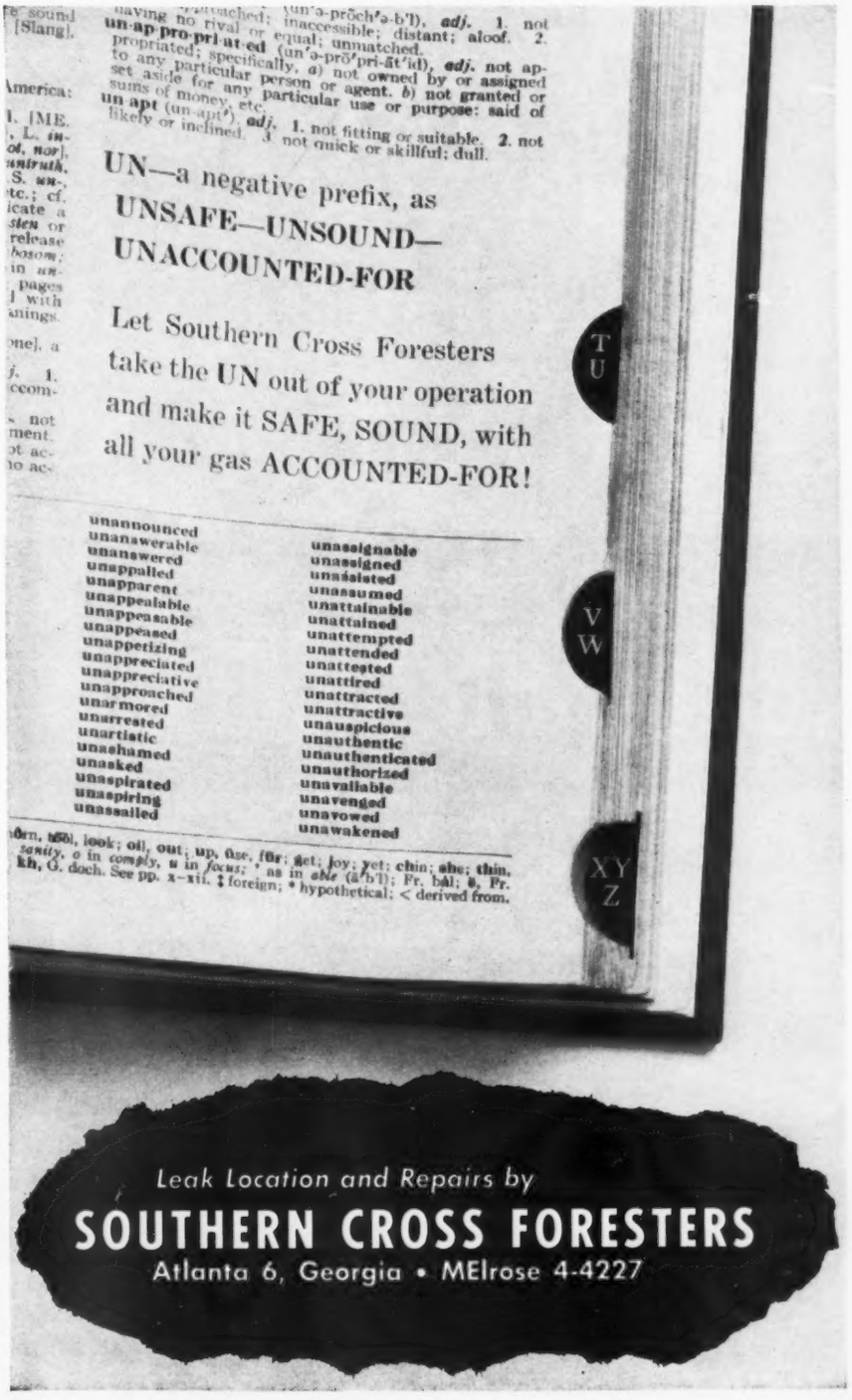

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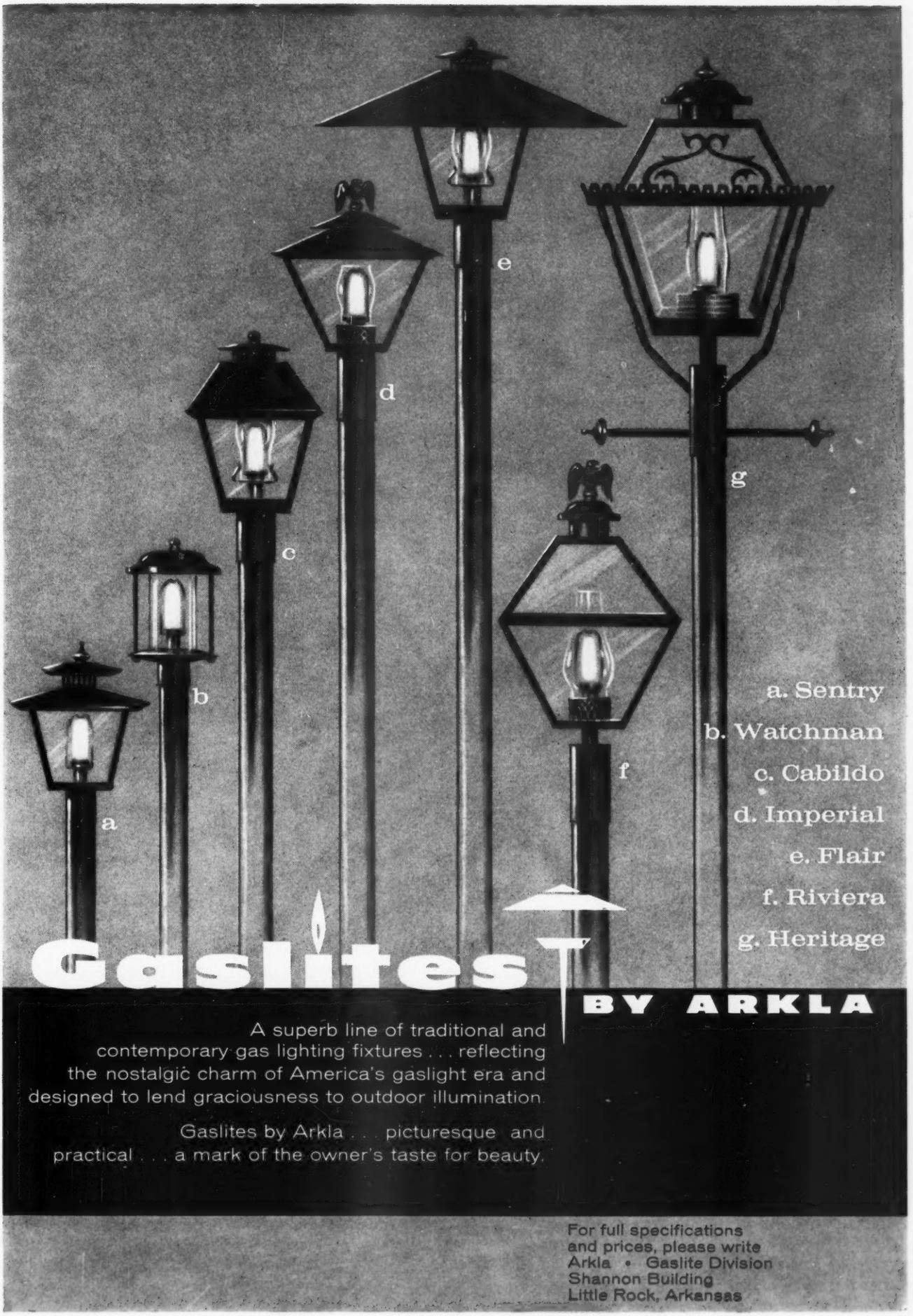
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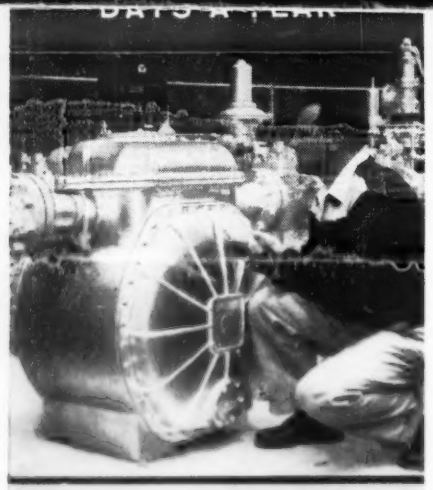

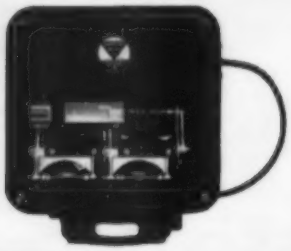

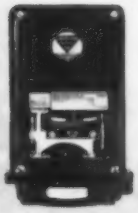

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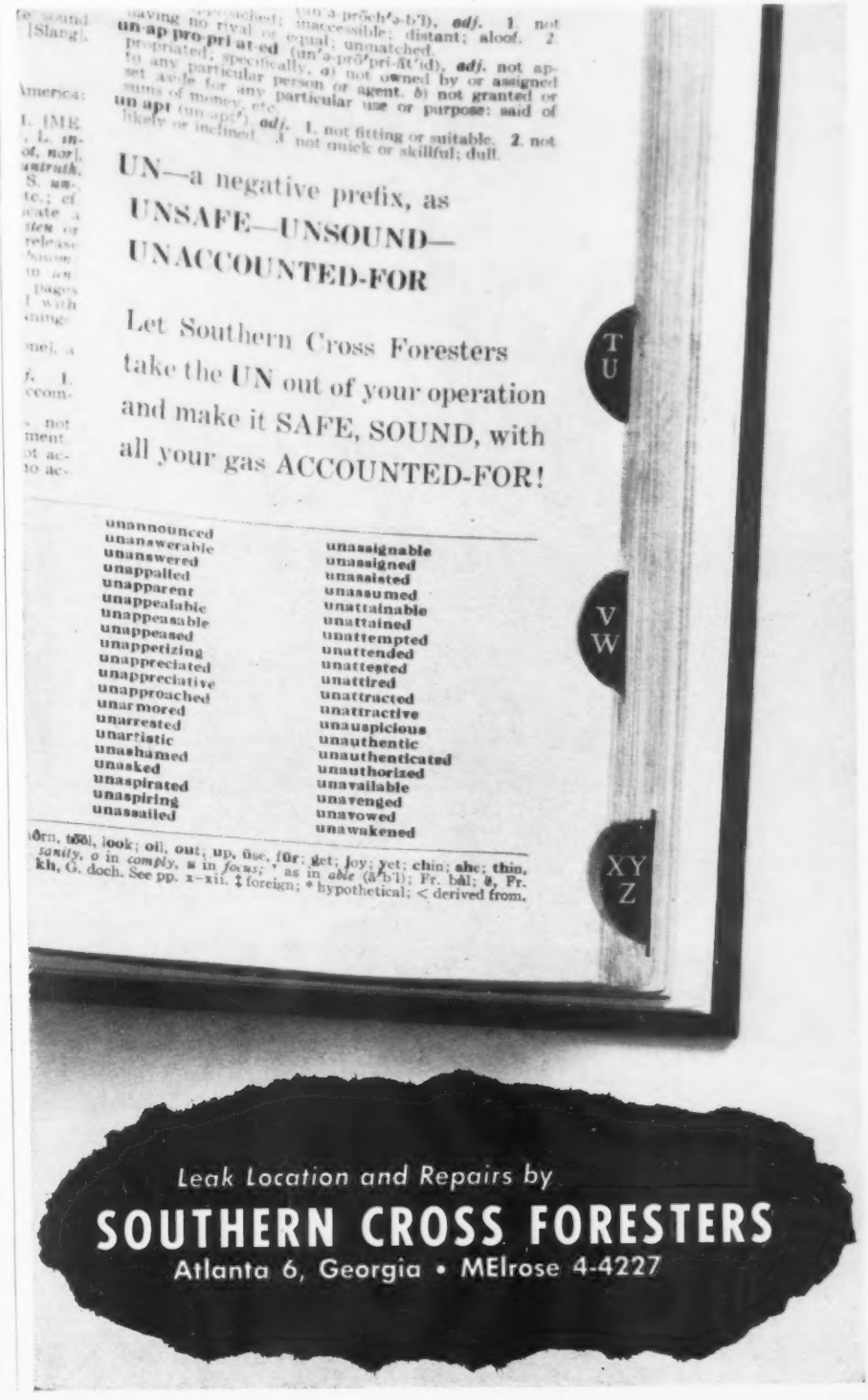

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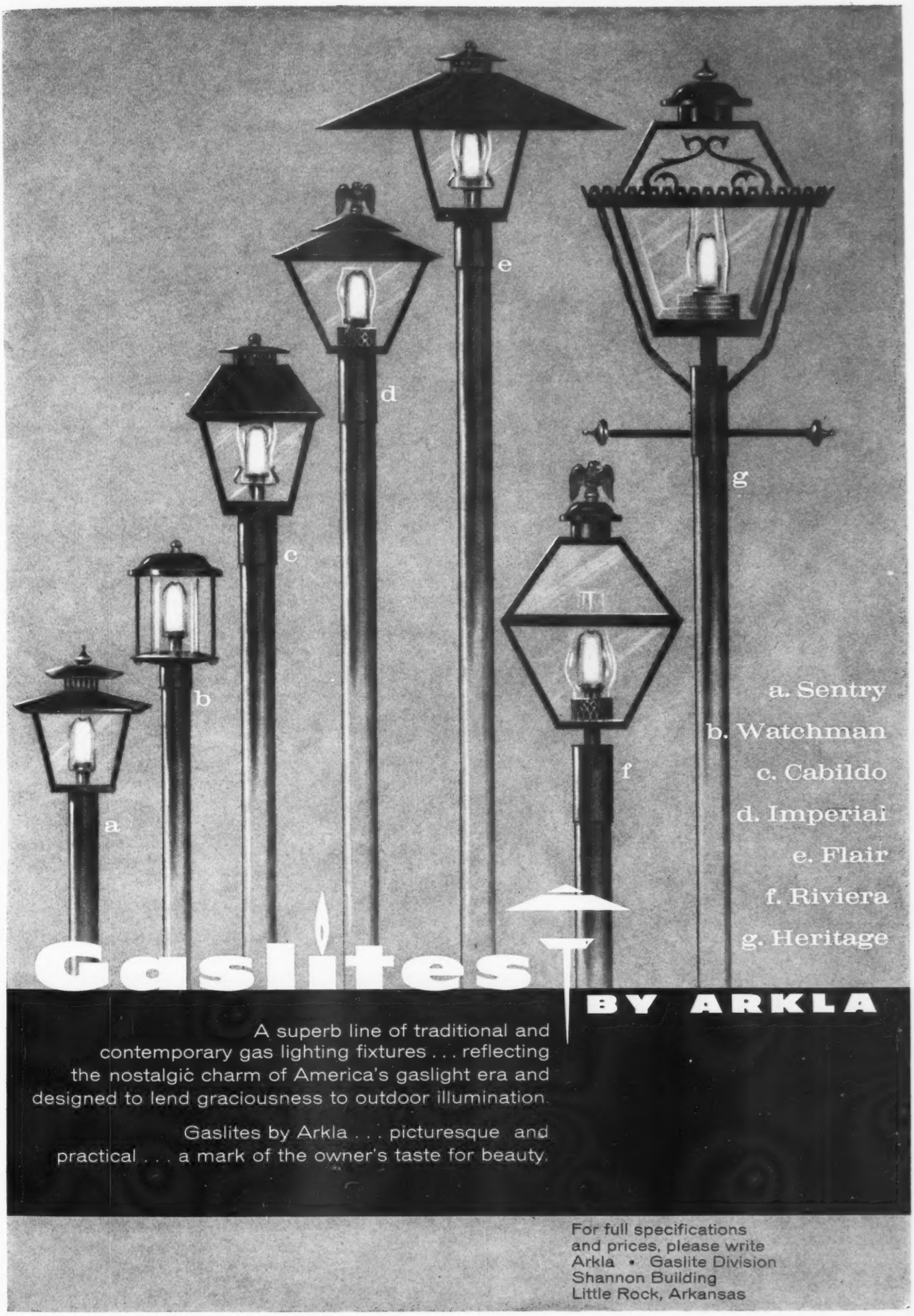
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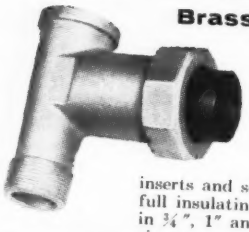

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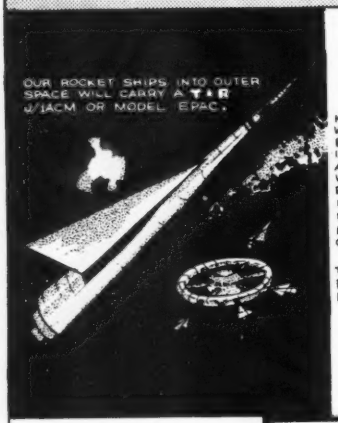

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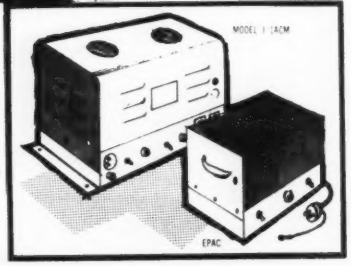
MODEL J/1ACM HOLIDAY DETECTOR WAS DESIGNED PRINCIPALLY TO BE USED AS A CONTINOUS INSPECTION DEVICE ON COATING AND WRAPPING MACHINES WHICH USE WATER FOR COOLING PURPOSES AND IN WHICH PROCESS ELECTRICAL INSPECTION OF THE PIPE IS DESIRED IMMEDIATELY FOLLOWING THE COATING AND WRAPPING.

THE J/1ACM CAN BE MODIFIED FOR USE IN CONTINUALLY INSPECTING PLASTIC SHEETS.

MODEL EPAC HOLIDAY DETECTOR IS A HIGHLY EFFICIENT AND ECONOMICAL INSTRUMENT DESIGNED PRIMARILY FOR STATIONARY COATING OPERATIONS AT YARD OR RAILHEAD OPERATIONS WHERE 110 TO 115-VOLT AC POWER IS AVAILABLE.



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• Assist in economical & effective maintenance + repairs
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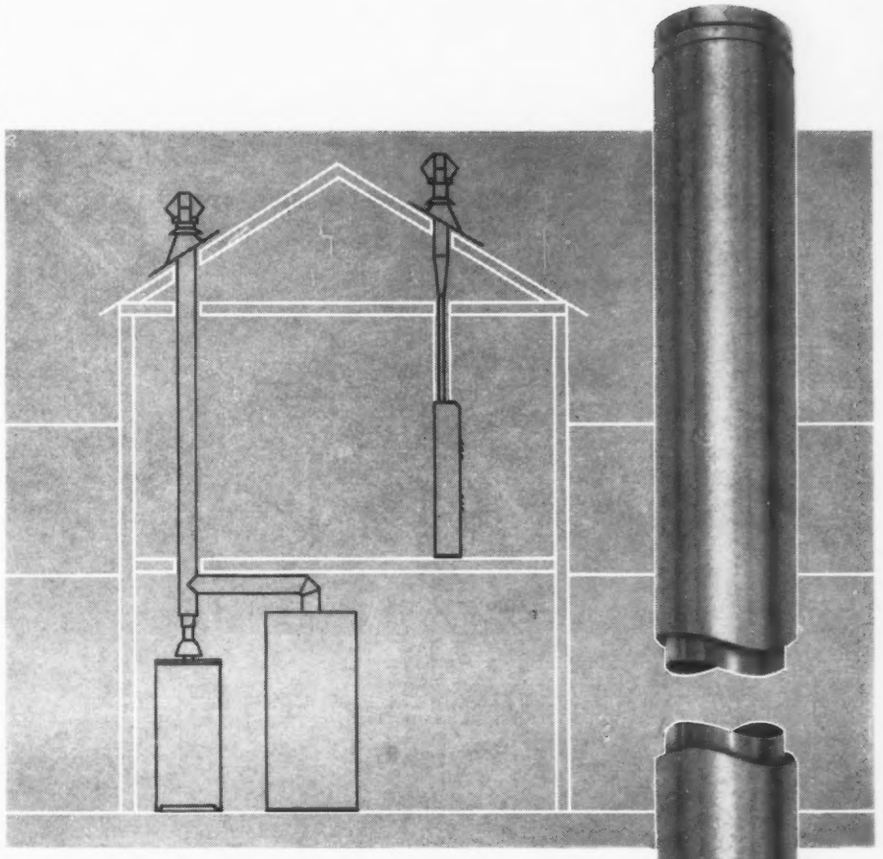
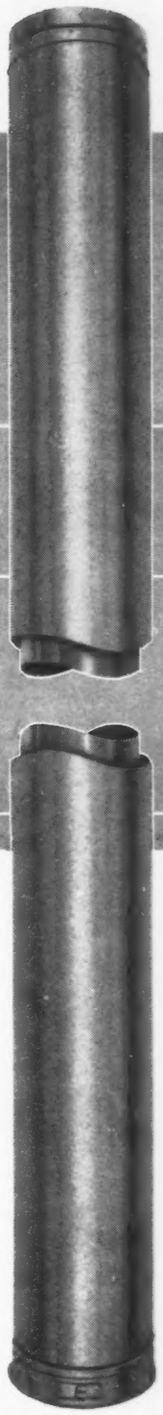


METALBESTOS double wall gas vent pipe installed in accordance with the "Safety System" Gas Vent Tables, assures you that the gas vent will function properly after installation. The "Safety Seal" on the gas vent system is your notice that the "Safety System" Gas Vent Tables were used for an accurate, scientific installation.

Write for your copy of the "Safety System" Gas Vent Tables to Dept. AA-10.



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FILL ALL YOUR EQUIPMENT NEEDS FROM

one dependable source

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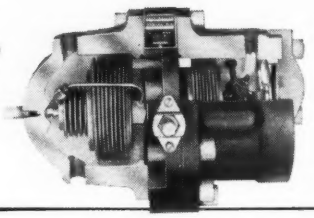
American-Westcott Dri-flo and Mercury Manometer Recording, Indicating and Integrating Models.



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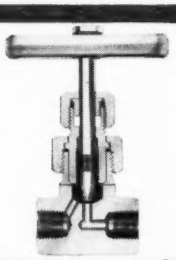
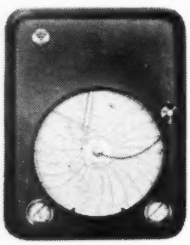
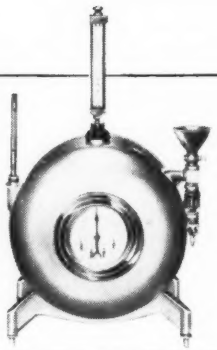
Forged Steel Needle Valves, Orifice Flanges and Fittings.





INSTRUMENTS

Series A-88 Controllers, Transmitters & Receivers ... Telemetering Systems.



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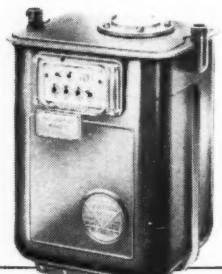
Complete Line for All Domestic Services.



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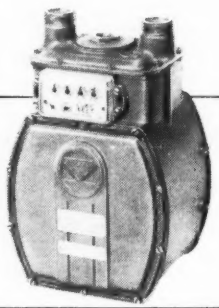
Aluminumcase and High Pressure Ironcase Models.



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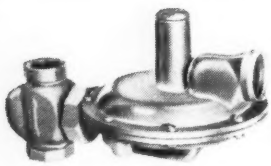
Complete Line for All Domestic Services.



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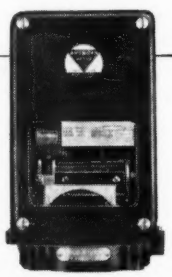
Mechanical Relief, Automatic Shut-off and Mercury Seal Models.

INDUSTRIAL REGULATORS

Complete Line of High Pressure Regulators and Motor Valves.

AUXILIARY EQUIPMENT

Base Pressure Index, Base Volume Index, Volume & Pressure Gage and Proving Apparatus.



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AMERICAN® METER COMPANY

INCORPORATED (ESTABLISHED 1836)

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SUPPLIERS TO THE GAS INDUSTRY for Ironcase, Tinned Steelcase, Aluminumcase and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments Reliance Regulators • Apparatus • Valves

THE

AMERICAN GAS-LIGHT JOURNAL.

JOHN B. MURRAY & CO., BANKERS, NO. 40 WALL STREET, NEW YORK CITY,

PROPRIETORS.

No. 1. NEW YORK, FRIDAY, JULY 1, 1859. $3 PER ANNUM. PUBLISHED MONTHLY.

OUR FIRST NUMBER.

Of this, our first number, we issue ten thousand copies, which will be forwarded to subscribers and otherwise distributed in all the cities and towns of the Union, among Gas-Light and Water Companies, their Shareholders and Contractors, and among Banks, Bankers, Merchants, Manufacturers, and owners of Real Estate.

Our sheet was intended originally, and, indeed, prepared to be set up, as a private circular—a mere Price Current of the Gas Light Shares of a few of the principal cities—for gratuitous distribution, monthly, to our own correspondents and dealers; but while in the course of preparation, in the early part of June, we were solicited to enlarge the sphere of our plans, by embracing all the American companies, together with such details as would enable parties interested to compare notes, and avail themselves of every means of improvement, economy, and profit. We acceded to this request, and a sheet of four pages was soon ready to be issued. Others then expressed a desire to adopt this medium of advertising their business to companies and individuals engaged in the manufacture and consumption of gas, as being more direct than any now existing.

Yielding to all these suggestions, we present THE AMERICAN GAS-LIGHT JOURNAL, as the first paper, however small and inconsiderable, ever published in this country, identified with that important interest, the magnitude of which is illustrated by the footings of our tables, showing 183 Companies to represent an aggregate capital of thirty-one million six hundred and sixty-one thousand five hundred and seventy dollars, while we have not more, perhaps, than two-thirds of all the Companies yet registered. We hope, however, to secure a complete List before our second number goes to press, when we think the grand aggregate will foot up four hundred Gas-Light Companies, representing a gross Capital of fifty, perhaps fifty-five, millions of dollars!

That so large and diffusely scattered an interest should have been left till this day unrepresented by a paper of its own, is indeed surprising in this protective age, and it was our only ambition in assuming the labor and responsibility of it, to place before our friends and correspondents, in an authentic form, a sound and reliable security for the investment of their funds, which have been left hitherto measurably to our own discretion. They have now the means of judging for themselves. We did not expect to profit by the JOURNAL otherwise than indirectly, as an auxiliary to our regular banking and brokerage business; but we have the pleasure to state that, so fully has it met the approval of those to whom the prospectus has been submitted, it goes forth at its first number a SELF-SUSTAINING PAPER—an unusual case, we believe, for a new publication on a comparatively unconsidered subject.

We have been long satisfied of the superiority of Gas-light shares as an investment, over any other corporate security, especially since the crisis of 1857, which, while it crushed railroad and many other securities completely, may have tended to diminish, for the few months of that winter, the consumption of gas in large warehouses and manufactories; but it operated, on the other hand, to augment its profits by the depreciation in the cost of coal, iron, building material and labor.

The impetus given now to commerce throughout the length and breadth of the land, has more than equalized the temporary deficiency alluded to. Instance the old New York Gas-light Co., the pioneer on this island, which has steadily paid its eight and ten per cent. per annum for many a long year, with an occasional EXTRA DIVIDEND of ten per cent., and now one of TWENTY PER CENT. on the 1st of May last; whose stock has ruled as high as 150 per cent. for months, and for which we offered 175 since the first of June, without finding a seller.

The Manhattan Gas-light Company too, with its capital of four millions, divides regularly ten per cent. per annum, with an occasional extra dividend of ten per cent., and its stock firm at 150; and all this with the price of gas reduced to two dollars and a half per 1,000 cubic feet.

A reference to our Tables will show that the majority of other companies throughout the country pay from 8 to 10 per cent. per annum. Witness the Albany, Auburn, Baltimore, Boston, Bridgeport, Buffalo, Cincinnati, Hartford, Milwaukie, Ottawa, Pittsburgh, Raleigh, Roxbury, Troy, Washington and Wilmington companies—all above par, with the July dividend paid, and that dividend a very liberal one. Other companies, however, have felt very sensibly the diminished consumption, and their shares are depreciated correspondingly; but the returns from all speak now quite cheeringly of their prospects, and investments in some of these depreciated shares will pay large and certain profits. We shall take up hereafter the entire List alphabetically, and give full particulars of each company as soon as our complete organization will permit. We are arranging with a gentleman of scientific attainments, practically conversant with the business, to conduct the editorial part of the JOURNAL, our own occupations being quite foreign to that department, although identified with the subject as dealers in the securities it represents.

TO CORRESPONDENTS.

We wish to be kept informed of all improvements in the manufacture and circulation of Gas, and of machinery incident to it, and will publish with pleasure any communications on the subject, duly authenticated by signature. We will not publish signatures unless desired.

All communications for this JOURNAL should be addressed to JOHN B. MURRAY & CO.,
No. 40 Wall street, New York.

TO ADVERTISERS.

Advertisements—especially those relating to materials used in the manufacture, improvement or distribution of gas, or in the construction of works—should be sent in at once, in order to appear in our second number. Yearly advertisements, $25 to $100, according to the space occupied. SPECIAL ADVERTISEMENTS double these rates. In all cases, the JOURNAL will be served gratis during the continuance of the advertisement. Advertisements of Gas-Fitters, Plumbers and Gas-Fixtures, will be arranged in separate columns for Albany, Buffalo, St. Louis, Mobile, Philadelphia, Boston, Baltimore, New Orleans, and other places. The circulation of the JOURNAL, in all the cities and towns where gas-light is used, will render it a desirable medium for local advertising of that description.

TO POST-MASTERS.

Post-Masters and others who remit us Twenty dollars at one time, will receive *eight copies* of the JOURNAL for one year, addressed as they may direct; or for Ten dollars we will send *four copies*. We pre-pay the postage on the JOURNAL in all cases. Please distribute the copies of this number sent herewith.

ADVERTISING is the lever with which, resting on Enterprise as the fulcrum, Commerce moves the world.

TO GAS AND WATER CONSUMERS.

We have had enquiries from several quarters whether our columns will be open to communications and suggestions to, the gas and water companies from consumers and others. Undoubtedly they will. The very object of the JOURNAL is to be a medium of communication between the companies and between the companies and consumers.

MARRIED.

At Hudson, N. Y., on 2d June, by the Rev. Henry Darling, of Philadelphia, CHARLES ROOME, Esq., President of the Manhattan Gas-Light Company, to MARY M. WELLS, daughter of Richard I. Wells, Esq., of the former place.

OFFICIAL.

New York State Inspector of Gas Meters,
OFFICE No. 561 BROADWAY.

The whole number of Gas Meters proved since the new law took effect, 4th May, 1859, is..... 4,620
Daily number proved, about..... 125
Number of proving apparatus used..... 17

Time required in proving, from 10 minutes to 1 hour each.

The meters found incorrect have been about 4 per cent. Nearly all new meters are Rotary or Slide Valve Dry Meters.

The Patent Eccentric Valve will eventually supersede all other kinds.

NEW YORK, June 30, 1859.

GEORGE H. KITCHEN,
State Inspector.

JOHN B. MURRAY & CO'S.

Price Current of the GAS-LIGHT SHARES of CITIES and Towns, corrected June 30, 1859.

No.	Organized.	Town.	State.	Capital.	Dollars each Share.	Semi-Ann'l Div.	Dividends payable.	Price per cent.	No.	Population of Gas District.	Private Consumers.	Public Lamps.	Price 1,000 feet.	REMARKS.
1	1857	Adrian	Mich.	50,000	50		May & Nov.	84	1	3,500	230	20	3 50	Earnings applied to extension.—S. B. Barker, Sec.
2	1857	Akron	O.	10,000					2		120	22	3 00	T. H. Goodwin, Sec.
3	1845	Albany	N.Y.	250,000	20	4	Jan. & July	105	3	65,000	8,200	510	3 00	
4	1853	Albion	N.Y.	30,000	100		Do.	90	4		116		3 80	
5		Allegheny	Pa.	140,000	25	4	May & Nov.	104	5					
6	1853	Allentown	Pa.	40,000	100	3½	Do.	100	6		300	30	3 50	
7	1857	Alton	Ill.	75,000					7		250	67	3 50	Geo. T. Brown, Owner.
8	1853	Annapolis	Md.	24,000	25		Jan. & July	95	8		109	70	4 00	A. Randall, Pres.
9	1858	Ann Arbor	Mich.	23,000	50	5	Mar. & Sept.	95	9		180	25	4 00	Commenced lighting, Sept. 1858.
10	1855	Attleboro'	Mass.	50,000	100	3	June & Dec.	75	10		151		4 00	Henry Rice, Clerk and Supt.
11	1850	Auburn	N.Y.	60,000	50	5	Jan. & July	100	11		400	120	7 00	Gas made of Rosin.
12	1853	Augusta	Me.	86,000	50		Do.	50	12		235		4 00	
13	1816	Baltimore	Md.	550,000	100	5	June & Dec.	185	13		8,200	1,800	2 50	Columbus O'Donnell, Pres. Length of mains 65 miles.
14	1852	Bangor	Me.	120,000	100	4	Jan. & July	104	14		764	30	3 50	
15	1853	Bath	Me.	68,000	100		Do.		15		230	18	3 75	
16	1858	Belfast	Me.	18,000	100		Do.		16		133		7 00	Rosin Gas. Works just commenced W. H. Burrill, Supt.
17	1856	Bellefont	Pa.	20,000	25	2	Do.		17		105	18	4 00	Doing well. Edmund Blanchard, Pres.
18	1854	Bethlehem	Pa.	23,000	50	3½	June & Dec.	100	18		207	29	3 80	
19	1853	Binghampton	N.Y.	50,000	50		May & Nov.		19	10,000	290	58	4 00	
20	1853	Bordentown	N.J.	50,000	50	2	June & Dec.		20		114	16	3 80	
21	1822	Boston	Mass.	1,000,000	500	5	Do.	140	21		10,410	2,265	2 50	Quarterly div. 2½ per cent., Mar., June, Sept., Dec.
22	1851	Bridgeport	Ct.	75,000	25	4	Jan. & July	100	22	10,000	500	58	4 00	Surplus on hand. Doing well.
23	1857	Bridgeton	N.J.	22,000	20		May & Nov.		23		169	13	4 00	W. D. Woodruff, Pres.
24	1855	Bristol	R.I.	35,000	50	4	Jan. & July	70	24		120	24	4 00	
25	1825	Brooklyn	N.Y.	2,000,000	25	5	Do.	130	25		10,000	2,600	3 00	
26	1845	Buffalo	N.Y.	600,000	50	5	Do.	115	26	90,000	3,800	2,000	3 50	Stock worth 120 per cent. on the books.
27	1853	Burlington	Vt.	75,000	25		Do.		27		220		4 50	
28	1852	Cambridge	Mass.	200,000	100	4	Feb. & Aug.	106	28		1,294	257	3 50	Extra div. 5 per cent., April 15, 1859.
29	1853	Camden	N.J.	100,000	100	3	April & Oct.	100	29		700	140	3 50	O. W. Goodwin, Supt.
30	1853	Canandaigua	N.Y.	50,000	50		Jan. & July	90	30		190	21	4 00	
31	1858	Cattskill	N.Y.	10,000			Private		31	3,000	134	20	4 00	Owned by G. T. Sutton, Peekskill.
32	1846	Charleston	S.C.	723,800	25	4	Jan. & July	112	32				4 00	
33	1851	Charlestown	Mass.	150,000	50	4	Do.	120	33	25,000	1,150	210	3 50	Light Somerville also Popn. 7,000.
34	1858	Charlotte	N.C.	14,000	50	6	Mar. & Sept.	110	34	8,500	120	50	7 00	Rosin gas. Waterhouse & Bowes, builders and lessees.
35	1849	Chicago	Ill.	750,000	25	5	Jan. & July	105	35		4,100	970	2 50	New contract with City Council for 12 years.
36	1841	Cincinnati	O.	1,000,000	100	5	Do.	115	36		6,000	1,700	2 50	
37	1854	Cohoes	N.Y.	50,000	20	3½	Do.		37				3 60	
38	1853	Columbia	Pa.	37,500	25		Do.	70	38		250	21	3 50	
39	1853	Columbus	Ga.	54,175	25	5	Do.	95	39	8,000	246	77	6 00	Rosin gas. No debt. Two years' stock of Rosin.
40	1850	Columbus	O.	100,000	10	5	Do.	120	40	80,000	800	174	3 00	
41	1853	Concord	N.H.	45,000	50	4	Do.	112½	41		400	85	3 50	
42	1854	Cumberland	Md.	60,000	50	3	Do.		42	6,000	230	86	4 00	
43	1857	Danbury	Ct.	15,000	25	4	Do.	100	43		118		4 00	
44	1848	Dayton	O.	50,000	25	4	Feb. & Aug.		44	25,000	515	165	4 00	
45	1853	Dedham	Mass.	40,000	50		Jan. & July		45		112		4 00	Henry W. Richards, Treas.
46	1849	Detroit	Mich.	250,000	50	5	Do.	100	46		1,417	491	3 50	
47	1857	Dorchester	Mass.	110,000	100		Do.	50	47		210	50	4 00	Good works, and well managed, but quite new.
48	1853	East Boston	Mass.	133,000	25	4	Do.	102½	48		475	270	3 50	George H. Plummer, Treas.
49	1853	East Greenwich	R.I.	11,200	100	15	Do.	100	49		100		7 00	Rosin Gas. Works not extended to the town.
50	1850	Easton	Pa.	125,000	50	4	June & Dec.	120	50		657	76	3 60	Capital in use, $108,850.
51	1850	Eastport	Me.	81,000	55		Do.		51		185	15	4 00	
52	1855	Elizabeth	N.J.	100,000	20	3½	Jan. & July	95	52		250	40	3 80	Capital in use, $59,000.
53	1852	Elmira	N.Y.	50,000	25	3½	Do.	70	53				4 00	Please fill blanks.
54	1859	Fayetteville	N.C.	25,000	100	6	Do.	100	54	7,000			6 00	Rosin gas. Waterhouse & Bowes, builders and lessees.
55	1857	Fishkill	N.Y.	12,000	25		Do.		55	1,000	60		6 00	Undergoing the water-cure.
56	1853	Fitchburg	Mass.	45,000	50	3	Do.	60	56	7,000	180	84	4 00	H. F. Coggeshall, Supt.
57	1855	Flushing	N.Y.	41,000	50	1¼	Mar. & Sept.		57		134	18	4 00	Original capital $20,000.
58	1840	Frankfort	Ky.	80,000			City Works		58		140	72	4 50	Works owned by city. Av. gross receipts $7,500.
59		Fredericksburg	Va.	75,000	50	3½	Jan. & July	40	59					
60	1851	Frederick City	Md.	36,000	100		Do.		60		300	40	6 70	Rosin gas. Owned by Brown & Co.
61	1853	Fredonia	N.Y.	10,000	50		Do.		61		87	8	4 00	Natural gas, issuing from a rock.
62	1855	Galena	Ill.	80,000	50		Do.		62		236	60	4 00	
63	1854	Geneva	N.Y.	75,000	25	3½	Do.		63			84	4 00	
64	1854	Glenn's Falls	N.Y.	85,000	50	3	Feb. & Aug.	80	64		161	18	4 00	
65	1854	Gloucester	Mass.	40,000	50		Jan. & July		65				3 50	"In debt. Will divide when we get any thing to divide with."
66	1854	Hagerstown	Md	15,000	10		Do.		66		125		7 50	Changing from oil gas to coal.
67	1857	Harlem (N.Y. City)	N.Y.	300,000	50	3½	Do.	105	67		700	1,800	3 50	Shares rising. District north of 79th Street.
68	1849	Hartford	Ct.	175,000	25	4	Do.	105	68				3 50	Price to be reduced.
69	1856	Hollidaysburg	Pa.	30,000	25	3	Do.	80	69	4,000	200	10	3 50	J. A. Landis, Pres.
70	1854	Honesdale	Pa.	30,000	25	3	Do.	80	70		180	85	4 00	
71	1853	Hudson	N.Y.	50,000	100	3½	Mar. & Sept.	100	71		260	64	4 00	Oliver Bronson, Pres.
72	1856	Huntsville	Ala.	50,000	25	25	June & Dec.		72		600	100	5 00	Yearly dividends 50 per cent. We have some shares for sale.
73	1857	Iowa City	Iowa.	40,000	50		Feb. & Aug.		73					
74		Ithica	N.Y.	72,000	25	3½	Jan. & July	67½	74					
75	1857	Jackson	Mich.	25,000	50		Do.	70	75		125	20	3 50	Earnings applied to improvements.
76	1856	Jamaica	N.Y.	20,000	25	4	Do.	90	76		130	20	4 00	J. G. Lamberson, Sec.
77	1856	Janesville	Wis.	50,000	50	3	Do.		77					Mortgage debt $20,000.
78	1858	Jersey Cy. & Hoboken	N.J.	300,000	20	4	Do.	120	78		1,900	212	3 00	
79	1856	Johnstown	Pa.	40,000	25		Do.	50	79	10,000	251		3 00	S. H. Smith, Treas.
80	1848	Kalamazoo	Mich.	30,000	100		Do.		80	10,000			4 00	New company; no results.
81	1844	Kensington	Pa.	100,000	10	5	Feb. & Aug.	110	81		2,800	400	2 50	
82	1855	Kingston	Pa.	50,000	50		Jan. & July		82		240	30	4 00	
83	1854	Lafayette	Ind.	60,000	50	3	Do.		83		250	60	3 25	Charles Collins, Supt.
84	1849	Lancaster	Pa.	100,000	25	4	Do.	80	84		610	100	3 00	Capital in use $74,000.
85		Lansingburg					Private.		85					G. H. Norman, owner.
86	1849	Lawrence	Mass.	120,000	100	5	Feb. & Aug.		86		745	63	3 50	
87	1853	Lexington	Ky.	60,000	50	4	Jan. & July	100	87		300	104	4 00	
88	1856	Lewiston	Pa.	19,800	20		April & Oct.	80	88	3,000	150	18	3 60	J. W. Shaw, Sec. Thanks for your interesting letter.
89	1853	Louisville	Ky.	481,400	50	6	Jan. & July	125	89		2,839	988	2 70	Admirably managed. Robt. G. Courtenay, Pres.
90	1853	Lynchburg	Va.	70,000	25	5	Do.	104	90		320	50	3 80	Handsome surplus, and doing well.
91	1852	Macon	Geo.	75,000	25	4	Do.	112	91		254	105	5 00	
92	1851	Madison	Ind.	60,000	25	3	Do.	70	92	10,000	303	95	3 50	A. Todd. Pres.
93	1855	Madison	Wis.	100,000	25		Do.		93		220	70	6 00	
94	1854	Malden & Melrose	Mass.	50,000	100	3	Feb. & Aug.	100	94	180		25	4 00	J. T. P. Hunt, Agent.
95	1852	Manchester	N.H.	100,000	100	5	Jan. & July	110	95	25,000	800	125	3 00	
96	1830	Manhattan (N.Y.Cy.)	N.Y.	4,000,000	50	5	Do.	150	96	600,000	25,000	8,576	2 50	Capital in use $3,000,000. We have orders for this stock.
97	1857	Marietta	O.	30,000	50		Do.		97		125	7	4 00	
98	1855	Meadville	Pa.	3 ,000	25		Do.		98		150	90	3 50	Out of debt, and doing well.
99	1852	Middletown	Ct.	50,000	25	3	Mar. & Sep'.	9			250	30	4 00	
100	1852	Milwaukie	Wis.	400,000	50	5	Jan. & July	105	100	24,000	1,450	265	3 50	Capital in use $242,000. An excellent stock.
101	1855	Mount Holly	N.J.	16,650	50	3	April & Oc.		1 1		140		7 00	Rosin gas.
102	1857	Muscatine	Iowa.	50,000	25		Jan. & July		102					
103	1845	Nantucket	Mass.	86,000	100	4	Feb. & Aug.	95	103		270	65	4 00	Geo. W. Macy, Pres.
104	1850	Nashville	Tenn.	140,000	50	6	Jan. & July	110	104		700	200	4 00	
105	1846	Newark	N.J.	800,000	50	4½	Do.	110	1 5		2,400	453	3 50	
106	1852	New Brunswick	N.J.	100,000	20	4	Do.	115	106		460	75	3 80	Capital in use $53,800.

JOHN B. MURRAY & CO.'S

Price Current of the GAS-LIGHT SHARES of Cities and TOWNS, Corrected June 30, 1859.

No.	Organised.	Town.	State.	Capital.	Dollars each Share.	Semi-Ann'l Div.	Dividends payable.	Price per cent.	No.	Population of Gas District.	Private Consumers.	Public Lamps.	Price 1,000 feet.	REMARKS.
107	1857	Newcastle	Del.	22,300	10	3	Jan. & July	95	107	1,200	1:2	19	4 00	Thos. T. Tasker, Pres; M. M. Cleaver, Treas.
108	1848	New Haven	Ct.	200,000	25	4	Do.	180	108		2,004	201	4 00	Shares risen 25 per cent. in 6 months.
109	1853	New London	Ct.	70,000	50	3	Do.	100	109		800	12	4 00	J. N. Harris, Sec. and Treas.
110	1835	New Orleans	La.	1,500,000	100	6	Do.	154	110		5,000	2,000	4 50	Extra dividend of 3 per cent. paid May 1.
111	1853	Newport	R.I.	130,200	100	4	Do.	105	111		500	96	3 50	Henry Bull, Pres.; John H. Cozzens, Sec.
112	1823	New York	N.Y.	1,000,000	50	5	May & Nov.	170	112	100,000	15,000	4,000	2 50	
113	1853	Norristown	Pa.	41,700	25	3	Jan. & July	105	113		350	850	3 75	
114		Northern Liberties	Pa.	400,000	25	7½	June & Dec.	140	114				2 50	
115	1857	Norwalk	Ct.	26,670	25	4	Feb. & Aug.	105	115		205	8	4 00	New, but prosperous. Isaac S. Burr, Treas.
116	1855	Norwich	Ct.	75,000	25	4	Do.	100	116		500	100	3 50	S. Dunham, Prest., B. M. Douglass, Supt.
117		Oswego	N.Y.	65,000	25	4	Do.	85	117					No report received. Why?
118	1855	Ottawa	N.Y.	45,000	25	6½	Do.	100	118		222	71	4 00	W. W. Cushman, Pres.; L. Mason, Sec.; W. Cogswell, Supt.
119	1856	Owego	N.Y.	40,000	50	3½	Do.		119		180	36	4 00	
120	1857	Palmyra	N.Y.	12,000	50		Do.		120		120		3 50	
121		Paterson	N.J.	110,000	5	3	Do.	95	121		600	96	4 50	
122	1850	Pawtucket	R.I.	65,000	50	4	Do.	106	122		475	75	3 50	
123	1855	Peekskill	N.Y.	81,000	25	3	June & Dec.		123	4,000	190	37	4 00	G. T. Sutton, Lessee.
124	1855	Peoria	Ill.	90,000	50		Do.		124		340	140	3 50	
125	1852	Petersburg	Va.	120,000	25	5	Jan. & July	100	125	20,000	560	192	3 80	Jas. N. Nichols, Pres.; W. H. Baxter, Sec.
126	1841	Philadelphia	Pa.	3,000,000			City Works.		126	650,000	82,000	5,000	2 25	Revenue $1,100,000. Length of mains 255 miles.
127	1855	Piqua	O.	50,000	50		Jan. & July	95	127		175	51	4 00	
128	1856	Pittsburg	Pa.	300,000	50	5	Do.	140	128		2,500	516	1 50	John M. Christy, Treas.
129	1854	Pittsfield	Mass.	40,000	100		Do.	60	129		210		4 00	Capital should be reduced to $20,000.
130	1853	Plymouth	Mass.	40,000	100		April & Oct.		130		181	5	4 00	
131	1849	Portland	Me.	250,000	50	4	Jan. & July	110	131	30,000	1,300	242	3 50	Doing admirably. For public lamps $3 00 per 1,000 feet.
132	1851	Portsmouth	N H.	60,000	100	3	April & Oct.	90	132		425	81	4 00	Do. John Trundy, Agent.
133	1855	Portsmouth	O.	50,000	50	4	Jan. & July	100	133		850	68	3 50	
134	1855	Portsmouth	Va.	80,000	50	4	Do.	100	134		236	58	4 00	
135	1850	Pottsville	Pa.	104,500	50	2	Do.	50	135		520	62	3 80	Changed from rosin to coal, 1856.
136	1850	Poughkeepsie	N.Y.	70,000	25	4	Mar. & Sept.	85	136		625	60	4 00	S. B. Johnston, Treas.
137	1848	Providence	R.I.	525,000	50	4	Jan. & July	112½	137		4,000	820	3 00	
138	1854	Quincy	Ill.	89,650	50	4	June & Dec.	90	138		895	217	3 50	
139	1857	Rahway	N.J.	85,000	20		Jan. & July	100	139		150		4 00	
140	1858	Raleigh	N.C.	18,000	100	6	May & Nov.	110	140	5,000	108	34	6 00	Rosin gas. Waterhouse & Bowes, builders and lessees.
141	1848	Reading	Pa.	80,000	25	3	Jan. & July	75	141		700	40	3 00	
142	1852	Richmond	Va.	341,975			City Works.		142					Thos. H. Wynne, Supt.
143	1848	Rochester	N.Y.	200,000	50	5	Jan. & July	115	143		2,000	430	3 00	L. A. Ward, Sec. and Treas.
144	1852	Rome	N.Y.	35,000	100	3½	Do.		144			20	3 60	
145	1854	Rondout & Kingston	N.Y.	65,000	20	3½	June & Dec.	100	145		375	86	4 00	
146	1854	Roxbury	Mass.	150,000	100	5	Jan. & July	110	146		1,100	260	3 50	Quarterly div., 2½ per cent., Jan., April, July, Oct.
147		Saco	Me.	71,600	100	3½	April & Oct.		147		220	18	4 00	
148	1847	Saint Louis	Mo.	600,000	50		June & Dec.		148		4,000	1,550	3 50	
149	1857	Saint Paul	Min.	200,000	50	3	Jan. & July	75	149		150	154	6 00	High price caused by freighting coal from Pittsburg.
150	1850	Salem	Mass.	125,000	100	4	Feb. & Aug.	110	150		1,800	150	3 50	12 miles street mains.
151	1859	Salisbury	N.C.	14,000	50	6	May & Nov.	100	151	3,500	70	50	6 00	Rosin gas. Waterhouse & Bowes, builders and lessees.
152	1854	Sandusky	O.	75,000	50		April & Oct.		152		800	70	3 00	City lamps extinguished at 11 P.M.
153	1854	Saratoga	N.Y.	75,000	100		Jan. & July		153		250	20	3 60	C. E. Durkee, Supt.
154	1851	Schenectady	N.Y.	Private.			Private		154	11,000	400	160	4 00	Smith & Craige, Proprietors.
155	1856	Seneca Falls	N.Y.	80,000	50	2	Jan. & July	60	155		220	87	4 00	M. L. Bellows, Supt.
156	1855	Stamford	Ct.	22,000	25	5	April & Oct.	110	156		140	55	4 00	
157	1859	Staunton	Va.	18,000	50	6	Jan. & July	100	157	4,000	70		7 00	Rosin gas. Waterhouse & Bowes, builders and lessees.
158	1848	Syracuse	N.Y.	125,000	25	5	Mar. & Sept.	100	158		1,200	260	3 80	
159	1859	Tarrytown	N.Y.	70,000	50				159				4 00	Entirely new; hardly under way.
160	1853	Taunton	Mass.	60,000	50	3	Jan. & July	100	160		245	44	4 00	
161	1847	Trenton	N.J.	100,000	20	4	Do.	100	161	15,000	700	95	3 80	Quarterly div. 2 per cent., Jan., April, July, Oct.
162	1848	Troy	N.Y.	200,000	100	4	June & Dec.	110	162		1,575	312	3 60	
163	1849	Utica	N.Y.	80,000	100	4	April & Oct.	100	163		612	112	3 60	H. H. Fish, Sec. & Treas.
164	1854	Vicksburg	Miss.	66,000	50		Mar. & Sept.		164		220	115	4 50	W. H. Shaw, Sec.
165	1848	Washington	D.C.	500,000	20	5	Jan. & July	120	165		2,500	800	3 50	Congress is equal to probably 2,500 more.
166	1854	Waterbury	Ct.	100,000	25		Do.		166		200	36		C. B. Merriman, Pres; H. B. Field, Sec.
167	1858	Waterford	N.Y.	12,000			Do.		167		80			W. T. Seymour, Sec.
168	1854	Watertown	Mass.	100,000	100	2	Do.		168		262	57	4 00	
169	1852	Westchester	Pa.	50,000	25	2½	Feb. & Aug.		169		548	64	3 50	
170	1858	West Troy	N.Y.	100,000	50	3	Jan. & July	80	170		425		4 00	An improving company.
171	1850	Wheeling	Va.	75,000	25	6	Do.	103	171		700	129	2 70	
172	1850	Williamsburg	N.Y.	837,500	50		Do.	75	172				3 50	We have orders for this stock. Please fill blanks.
173	1857	Williamsport	Pa.	31,000	25		Do.		173	6,500	253		3 80	Capital in use $24,575.
174	1853	Wilmington	N.C.	60,000	50	5	Do.	102½	174		286	62	5 00	Rosin gas. Surplus invested in improvements.
175	1852	Wilmington	Del.	130,000	50	5	Feb. & Aug.	132	175		1,250	130	3 50	Ferris & Garnett, of Wilm. are erecting gas-works in Guyaquil, S.A.
176	1854	Winchester	Va.	36,000	50	2½	Mar. & Sept.	75	176		195	40	4 00	
177	1856	Woodstock	Vt.	7,950	50	4	Jan. & July	70	177		79	1	6 00	Rosin gas.
178	1858	Woonsocket	R.I.	82,600	100	5	Do.	75	178		200		3 50	R. G. Randall, Treas.
179	1849	Worcester	Mass.	120,000	100	5	Do.	90	179		920	127	3 50	
180	1854	Yonkers	N.Y.	70,000	50		Do.		180		290		3 80	
181	1849	York	Pa.	40,000	50	3	June & Dec.	90	181		314	87	7 00	Changed from coal to rosin. Alex. Small, Pres.
182	1858	Ypsilanti	Mich.	20,000	50		Feb. & Aug.		182		140	20	4 00	Commenced lighting, Aug. 1, 1858.
183	1848	Zanesville	O.	44,600	25	4	Do.		183		318	78	3 50	Thos. Halpin, Sec.

CANADA GAS-LIGHT COMPANIES.

1	1848	Kingston	C.W.	20,000	100	5	Mar. & Sept.	105	1	12,000	400	106	3 50	John Kerr, Manager.
2	1853	London	C.W.	100,000	20	5	May & Nov.	100	2	12,000	800	112	5 00	
3	1847	Montreal	U.C.	300,000	40	4	Mar. & Sept.	108	3	80,000	2,000	500	3 25	
4		Quebec	U.C.	180,000	200	4	Do.	116	4		1,217	365	3 00	
5	1847	Toronto	U.C.	400,000	100	4	Feb. & Aug.	99	5	50,000	1,919	674	3 33⅓	Quarterly div., 2 per cent. Feb., May, Aug., Nov.

Life Insurance.

Mutual Life Insurance Company,
OF NEW YORK,
No 94 BROADWAY.
CASH ASSETS, MAY 1, 1859,..... $5.263,591.89
ISAAC ARBATT, *Sec'y.* FRED. S. WINSTON, *Pres't.*

Knickerbocker Life Insurance Co.,
OF NEW YORK,
No. 17 WILLIAM STREET,
Assets $213,042.13.
STEPH. C. WHEELER, *Sec'y.* ERASTUS LYMAN, *Pres't.*

NEW YORK LIFE INSURANCE CO.,
No. 112 and 114 Broadway,
Accumulated Assets $1,595,901.56.
PLINY FREEMAN, *Actuary.* MORRIS FRANKLIN, *Pres't.*

PORTABLE GAS WORKS.
BOGART & THOMPSON,
No. 499 Broadway, New York.

OLIVER BARRETT & Co.,
Gas-fitters and Plumbers,
120, WEST BROADWAY, NEW YORK.

GAS METERS.
SAMUEL DOWN,
Manufacturer of Gas Metres,
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GAS GENERATING
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COOKING RANGE COMPANY,
No. 514 Broadway, New York.

N. Y. CAR and STEAMBOAT COMPANY.
GAS FITTED TO ALL MODES OF CONVEYANCE.
No. 117 FULTON STREET, NEW YORK.

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IMPORTERS OF BELGIAN FIRE-CLAY GLASS RETORTS,

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DEALERS IN TILES, ARCH-BRICKS, FURNACE DOORS, MOUTH-PIECES, COVERS, AND ALL OTHER FITTINGS, OF THE MOST APPROVED PATTERNS, FOR SETTING CLAY RETORTS.

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MANUFACTURER OF
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Retorts, Pipes, &c., &c. always on hand,
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IMPORTER OF
Paris Bronzes, Gas Fixtures, Carcel Lamps, &c.
FRENCH RAPE SEED OIL FOR SALE.
No. 623 BROADWAY, NEW YORK.

FELLOWS, HOFFMAN & CO.,
Elegant Gas Light Fixtures of every style and pattern made to order.
No. 74 BEEKMAN STREET, NEW YORK.

TIFFANY & CO.,
JEWELLERS AND IMPORTERS OF
ELEGANT ARTISTIC PARIS GAS CHANDELIERS,
BRACKETS, PENDENTS, &C., IN BRONZE AND GILT.
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Gas and Steam Fitter and Plumber,
No. 170 CENTRE STREET, NEW YORK.

LOCKE & CRAGIE,
PLUMBERS and GAS-FITTERS,
No. 12, East Twentieth Street, New York.

LOCKE, CRAGIE & CO.,
GAS-FITTINGS, CHANDELIERS,
BRACKETS, GLOBES, &c.
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GEORGE H. KITCHEN & CO.,
MANUFACTURERS OF FIXTURES
FOR GAS LIGHT PURPOSES,
WOOD'S BUILDING,
No. 561 Broadway, New York,
Office of the Inspector of Gas Meters for the State of N. Y.

BRADBURY M. JOHNSON,
GAS FITTER AND PLUMBER,
No. 111 East Eighteenth St., N. Y.
A large and elegant assortment of Chandeliers, Brackets, &c., &c. Gas Pipe and Posts made for Gas Light Companies on favorable terms.

PETER LOTH,
Maker of Gas-Light Fixtures
OF ALL PATTERNS,
No. 49 Greene Street, New York.

Gas Works.

MORRIS, TASKER & CO.,
PASCAL IRON WORKS,
[Established 1821.]
PHILADELPHIA,
MANUFACTURE
WROUGHT IRON WELDED TUBES,
For Gas, Steam or Water.

LAP-WELDED BOILER FLUES.

Galvanised Wrought Iron Tubes.

ARTESIAN WELL PIPES,
Of Wrought or Cast Iron, screwed together, flush inside and out.

Gas Works Castings,
RETORT AND BENCH CASTINGS FOR COAL GAS WORKS.

CAST IRON STREET MAINS,
Bends, Branches, Drips, &c.

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THOMAS T. TASKER, JR., STEPHEN P. M. TASKER.

Builders of Gas Works.

WATERHOUSE & BOWES,
BUILDERS OF GAS WORKS,
RALEIGH, N. C.
Gas Works erected in any part of the United States.
REFERENCES:

James H. Carson,	Pres't.	Charlotte Gas-W'ks,		N. C.
D. G. Fowle,	do.	Raleigh	"	N. C.
J. C. Smythe,	do.	Salisbury	"	N. C.
Arch. McClean,	do.	Fayetteville	"	N. C.
Joseph A. Waddell,	do.	Staunton	"	Va.
A. G. Story,	do.	Little Falls	"	N. Y.
Geo. H. Young, proprietor of Waverly,			"	Miss.

Wm. Johnston, Pres't Charlotte & S. C. R.R., Charlotte, N. C.
A. B. Wood, Agent Reading Iron Works, 57 Maiden lane, N. Y.
Cornelius Baker, manufacturer of gas fixtures, Phil'a.
G. B. Waterhouse. M. Bowes.

WM. L. SCHOENEN & CO.,
No. 135 & 137 William St., New York,
ENGINEERS and CONTRACTORS
For the erection of Coal Gas Works for Cities, Villages, Manufactories and Private Residences.

STEPHEN SCAMMON,
GAS ENGINEER,
And Contractor for the Erection of Gas Works.
ALSO, DEALER in
CAST AND WROUGHT IRON PIPE,
For Steam, Water and Gas.
561 Broadway, New York.

Portable Gas Works.

C. R. WOODWORTH,
MANUFACTURER OF
PORTABLE GAS WORKS
No. 1 Cedar St., (near Pearl St.) N Y. City.

Miscellaneous.

Gas Coal, Clay Retorts, Exhausters, &c.,
T. W. PARMELE,
No. 4 Irving Place, New York.

NEW YORK GAS BURNER CO.,
346 BROADWAY,
Room 18, Appletons Building.

Manufacture to order L. E. Hicks' Patent Gas Burner for Lighting Streets, Steamboats, Railroad Cars, Churches Theatres, Stores and Private Dwellings.

This burner has been subjected to every known test, of the justness of its claims in repeated instances, and by competent persons, and had the unqualified approval of the late Professor W. H. Ellet, chemist to the Manhattan Gas-Light Company, and of Mr. J. K. Brick, Superintendent of the Brooklyn Gas-Works. The experiments of these gentlemen prove that its "economy" over ordinary burners in the consumption of gas, for equal illuminating powers, is in the ratio of 232 to 100.

We think this array of authority at least entitles our new burner to a full and fair trial.

GEORGE W. KRAFT,
GASOMETER AND BOILER MAKER,
Chestnut Street Wharf, West Philadelphia,
MANUFACTURES
Gasometers, Retort House Roofs, Water Tanks, Purifying Boxes, Coal Cars, Coke Barrows, and all kinds of Wrought Iron Work for Bridges, Buildings, &c., &c., &c.
☞ Particular attention paid to Alterations and Repairs.
REFERENCES:
John C. Cresson, Engineer Gas Works, Philadelphia.
Joseph A. Sabbaton, Engineer Manhattan do., N. Y.
Col. W. S. Campbell, Engineer Gas-w'ks, N. Orleans.
P. A. Sabbaton, Engineer do. Albany.
Waterhouse & Bowes, Gas-engineers, Raleigh, N. C.
Joseph Battin, Newark, N. J.
Chas. B. Dungan, Philadelphia.

Gas Exhausters.
GEORGE WRIGHT & CO, LIVERPOOL.
T. W. PARMELE, Sole Agent.
No. 4 Irving Place, New York.

THE CASH PRINCIPLE.

It is a remarkable feature of the business of Gas-Light Companies, if not creditable directly to their management, that no instance of a failure is on record, while our Tables show the handsome average returns made upon the capital invested, and the high appreciation in which the shares are held, as indicated by the quotations. The main secret of the unexampled success of these companies, aside from the peculiar nature and necessity of their product, is, that they are conducted upon a *strictly cash principle.* No credit whatever is given—at least by our city companies—beyond a month at most; while many of the large consumers, such as theatres, concert rooms, hotels, and the like, are required to pay by the week, and occasionally in advance by the night.

This cash principle of collecting enables the companies to observe the cash principle of purchasing, which they do at a heavy discount from credit prices; the saving in these items alone constituting a handsome balance to the credit of dividend account. This, added to the great profit of the business itself, renders gas-light shares superior to most other investments.

We believe that the same principle applied rigorously to the business of a merchant—a dry-goods jobber, for instance—through the vicissitudes of twenty-five years, would confirm its entire soundness. Basing our opinion upon the popular statement that ninety-nine merchants out of a hundred fail in twenty years of a business life, the axiom is proved at once. Applied to newspapers, the result has been long since no problem. The *New York Herald* inaugurated it in 1835, amid the ridicule and scepticism of others of the city press; but perseverance and consistency established the soundness of its theory and achieved a success unexampled in the annals of newspaper experience. Its first number, dated May 6, 1835, is in the library of the *Herald* Buildings, a smaller sheet than this little JOURNAL. What the *New York Herald* of July 1, 1859, is, all our readers know. The *New York Tribune*, too, is a striking instance of the soundness of the principle. We believe it was the first to profit by the example of the *Herald.* Its mighty influence is now felt throughout the length and breadth of this land, and its daily specie income contributes not a little, by "strengthening its arms," to extend and establish its wide-spread power. Then the *New York Times*, whose splendid monument to these results towers above the City Hall in a majestic and stately pile that many a credit-advocate might justly covet, is another consideration which no sophistry can gainsay. But we can hardly name them all. The *Express*, the *Daily News*, the *Sun*, and the *Day Book*, are all strictly "cash-down" papers, while our friends of the *Evening Post* are steadily inclining that way, as is the old *Commercial Advertiser* and others. These are among the daily papers. The only strictly cash-in-hand weekly that we remember is the *Ledger*, the paper of BONNER THE INEVITABLE. It is reversing the order of book-keeping to post from the *Ledger* to the JOURNAL; so we content ourself with merely *quoting* the former, fervently hoping, by-the-by, that BONNER will not happen to cross our path, lest he seize upon these pages as he does occasionally upon the dailies, and monopolize them to carry the burden of his stories to the world. The circulation of the *Ledger* is estimated to be half a million of copies weekly, the whole of which is paid for in hard cash on delivery. What a mighty fortune is rolling up to its enterprising owner, free from losses by bad debts or change of fashion, and how liberally he dispenses it!

Recurring to gas-light stocks, we recommend them as a sound, permanent security to those who are dependent upon an income for support.

An established company, with well built works and one hundred consumers, in a prosperous town, free from debt and economically managed, cannot fail to prosper. The capital must represent honestly the actual investment in works, pipes and land, free from any "watering" of speculators—a system that should be discountenanced by all respectable men; for it is sure to be felt in the depreciation of the shares; the items of construction and fitting being now so well understood, a moment's calculation will expose the deception.

The condition of any gas-light company is capable, from the very nature of its business, of being ascertained every week—indeed every night. Its income should be collected promptly, and deposited safely, and there is no excuse for mismanagement otherwise. Those interested in small country companies should insist upon the utmost exactness in every department, that the security may preserve the enviable footing it is acquiring so rapidly throughout the country.

GAS-LIGHT-INGS.

BROOKLYN, N. Y.—We would be glad to know something of the Citizens' Gas-Light Company.

BRUNSWICK, ME.—Why is there not a gas-light company here? It is a large and flourishing town.

CATTSKILL, N. Y.—These works are owned by G. T. Sutton, Esq., of Peekskill.

CHICAGO, ILL.—We would feel obliged for information respecting the new Gas-Light Company, and of its probable effect upon the present one.

DOVER, DEL.—A company has been formed with a capital of $25,000. Charles N. Trump is the agent.

EASTON, PA.—We have received an interesting letter from M. H. Jones, Esq., President, giving the particulars of his Company. We wish all of the Companies would do likewise; it would assuredly benefit them. Mr. Jones says: "This Company has heretofore declared 5 per cent. semi-annual dividends, but the Board thought it advisable to reserve the dividends and provide for a contingent fund. Coal has cost us heretofore $8 to $8.50 per ton net. Our charter is perpetual, extending to South Easton and, by concurrent act of Legislature of New Jersey, to Philadelphia. The stock is worth really more than it is selling for. During the 10 per cent. dividends it sold as high as 140 per cent. Since its organization, the Company has divided between $50,000 and $60,000, and have received from consumers over $100,000 for gas.

FARMINGTON, CT.—No public gas-works. The Plainville Manufacturing Co. use their own rosin gas-light.

FREDONIA, N. Y.—The public buildings of Fredonia are lighted by a natural gas issuing from the bed of the creek. Several light-houses on the lake (Erie) shore are lighted also by the same carburetted hydrogen, which burns as brilliantly as coal or rosin gas.

GLENHAM, N. Y.—The Glenham Woolen Manufacturing Co. light their mills with (rosin?) gas of their own manufacture. The works were built by Mr. Stephen Scammon, whose card is in another column.

HARLEM, N. Y.—This Company is beginning to be appreciated. Its stock has risen in six months twenty-five per cent., and cannot be bought now under 105 per cent. Six months ago it was at 80. Under the management of Mr. Burr Wakeman it has paid one dividend of 3½ per cent. on 1st April, and another of same amount will be paid this month. We advised our friends to buy this stock months ago, and do so still. It has thirty miles of mains laid.

HERKIMER, N. Y.—There is no gas-light company in this place, but one mill is lighted with gas of their own manufacture.

LANSINGBURGH, N. Y.—These works are a private concern. G. H. Norman, Esq., is the owner.

LYONS, N. Y.—Subscriptions to the stock of this company are being taken, and we hope to report its complete success in our third number. The President, Mr. S. B. Garritt, will please accept our thanks.

MACON, GA.—Gas made from *pine wood* with Dr. Cresson's patent retort. The company consider it of greater illuminating power than coal gas. Geo. A. McIlhenney, Sup't.

MATTEAWAN, N. Y.—The people here want gas-works. It is a thriving manufacturing town. Population between 3,000 and 4,000.

METROPOLITAN GAS-LIGHT CO. OF N. Y. CITY.—Will somebody oblige us with information of this company?

MILWAUKIE, WIS.—We are informed that this Company has made sufficient during the fiscal year just closed to leave a handsome surplus after paying their two semi-annual dividends of 5 per cent. each. It pays its New York shareholders by drafts on the Phenix Bank in this city.

MORRISANIA, N. Y.—A gas-light company was organized in March last, but is not yet in shape for report.

MURRAY, N. Y.—A thriving town of nearly 3,000 inhabitants and several flourishing manufactories. Well built gas works of moderate capital would pay.

NEW ORLEANS, LA.—We insert a letter from this company as one of many we have received of the same character.

NEW ORLEANS GAS OFFICE,
June 14, 1859.

MESSRS. JOHN B. MURRAY & CO.,
BANKERS, New York:

Gentlemen,—I hope you will succeed in procuring the information you request. It is calculated to promote the interests of all gas companies. The operations of our company have, for the last three years, doubled both in receipts and profits; and we have but to congratulate the officers of the company for the ability displayed in their economy in extending a corporation whose future wealth is unbounded. Our prices for gas may seem to you very high; but you will in your statements please note that the soil of our city is exceedingly soft and marshy, and that our pipes are laid from six to ten feet under high-water line of the Mississippi river; that they are constantly sinking; and on this score (of repairs) no company in the United States labors under so heavy an item of repeated expenditure. Then, again, consider the tax on our capital, by City and State, of $30,000, and the price of coal averaging 50 c. per barrel of 1-2 lbs. on yearly contracts. This, with price of labor of white stokers at $1.75 and $2 per day, would devour our profits, were it not for the advantage of sixty negroes, the property of our company.

We would be happy if you could obtain of the several large gas companies in this country, their general system of accounts from coke clerk, registrar at stations, street inspector, &c., up, and thereby compare the most practical mode of carrying on the affairs of a large institution. Our system is, in some points, superior to any in the world; but we could yet, we hope, by comparisons, make it more perfect. I have filled all but one of your questions, and wish two copies of your JOURNAL to my addr.ss. Very truly yours,

A. S. POLK, Comptroller Gas Office.

NEWPORT, R. I.—One of the best managed companies on the list. Its annual report is brief, explicit and intelligible. Their replies to our inquiries were prompt; and the best evidence of the soundness of their stock is, that we have orders from their townsmen to buy it. We advised our friends to take it at 90. We will now pay 100 for it on order.

OTTAWA, ILL.—An excellent company, well managed, and good works.

PARIS, N. Y.—Private gas works owned by Holmes & Helswell for their woolen mills.

PEEKSKILL, N. Y.—These works are leased to Mr. G. T. Sutton until Dec. next, at six per cent. per annum upon the capital, and for three years thereafter at seven per cent., he keeping them in repair.

PHILADELPHIA, PA.—The City purchased the Spring Garden, Manayunk, Germantown, Southwark, and Moyamensing companies, as their charters expired, all of which are now consolidated into the City Gas-works. The rate paid averaged 200 per cent. Whole cost of works $2,971,621. Assets of works $4,330,179. Amount of gas manufactured in 1858 was 480,000,000 cubic feet.

PORTLAND, N. Y.—The light-house at Portland, N. Y., is lighted with natural gas, issuing from the ground.

SAG HARBOR, N. Y.—The gas-light works of this town will be in operation in Sept., and will be owned by Mr. D. Congdon.

SCHENECTADY, N. Y.—A private concern, owned by Messrs. Smith and Craige. It is not an incorporated company, nor has it a stated capital, but is doing, nevertheless, a good business. Sensible men.

SKANEATELES, N. Y.—Private works, owned by Anson Lapham, Esq.

WATERBURY, CT.—This stock was water-buried indeed, but Mr. Merriman's good management will soon raise it.

CLEGG ON GAS MAKING.—This admirable work having become entirely out of print, a new edition is being prepared by the London publishers, of which Messrs. D. Appleton & Co. will soon have a supply. The only copy that we can find here is in the Astor Library. We wish we could purchase or borrow one in private hands.

GAS-LIGHT IN CARRIAGES.—Why are not carriage lamps lit with gas? A meter could be placed under the driver's seat to contain a month's supply for private carriages, and a week's for hacks. It would be a vast improvement over candles and oil.

PAINE'S WATER-GAS.—*De mortuis nil nisi bonum.*

ROSIN GAS at $7 per 1,000 feet is considered equal to coal gas at $3.50.

WOODWORTH'S PORTABLE GAS WORKS.—Our readers will find these excellent works advertised on the 7th page.

FLOYD'S PATENT MALLEABLE IRON RETORT COVERS.

Patented, July 21st, 1857.

The above cut represents the MALLEABLE IRON RETORT COVER. It is made only a quarter of an inch thick, and convexed as shown in the sectional view, which gives it great strength. We make this cover of any required shape—the patent allowing us to adopt any form the taste of those using them may suggest. We have, in the above form, secured lightness and strength combined, and where there is no objection to it, this shape is preferable to any other.

The peculiar advantages of this invention are economy, durability and convenience, all of which are, upon the slightest examination, apparent to all who are familiar with the manufacture of Gas, or any article requiring the use of Retorts. This Cover is made of a very superior kind of malleable iron, being stronger and much better than wrought iron, and consequently of unlimited durability. It is less than half the weight of the cast iron Cover, such as have been in universal use, and its adoption is therefore a saving of labor in the Retort House. We give extracts from a few of the many letters received from those who have this Cover in use, including some of the largest Gas Manufacturing Companies in the United States;

OFFICE MANHATTAN GAS-LIGHT CO.,
No. 4 Irving Place, N. Y.

FLOYD'S PATENT MALLEABLE IRON RETORT COVERS far excel anything heretofore in use. * * * * The durability of this Cover is manifoldly greater than the old cast iron ones. Indeed, I can put no limit to the length of time they may be kept in use; I imagine that at the expiration of *ten* years these Covers will be as serviceable as when put in use. * * * *

(Signed,) JOS. A. SABBATON,
Eng. M. G. L. Co.

OFFICE NEW YORK GAS-LIGHT CO.,
No. 174 Centre street, N. Y.

From the experiments made with a few of FLOYD'S PATENT MALLEABLE IRON RETORT COVERS at these Works, I believe the entire use of them at the price you charge would in the end be a saving to Gas Companies, as they cannot, even by careless usage, be broken.

(Signed,) JNO. MOWTON,
Manager.

BROOKLYN GAS WORKS,
May 14, 1859.

Messrs. HERRING & Co., Gentlemen,—Yours of the 13th is at hand, and contents noted. We have used your patent Retort Lids for about eighteen months, and are well satisfied with their superiority over all other kinds in use.

Yours, truly, J. K. BRICK,
Engineer of the Brooklyn Gas-Light Co.

OFFICE PHILADELPHIA GAS WORKS,
Market and 23d sts., Philadelphia.

After eleven months' trial of FLOYD'S PATENT MALLEABLE IRON RETORT COVERS, I find them to be in every respect satisfactory, and much preferable to cast iron covers of greater weight. (Signed,) JNO. C. CRESSON,
Eng. Phila. Gas Works.

OFFICE ALBANY GAS-LIGHT CO.,
Albany, N. Y.

The advantages of FLOYD'S PATENT MALLEABLE IRON RETORT COVERS are great. They weigh much less than cast iron covers, and this is a considerable matter to the men who have to lift them as high as their heads, as in the case in the top Retort of five in a bunch, and are more economical to any Gas Works, being less liable to breakage, which is a serious item of expense during the year.

(Signed,) PAUL A. SABBATON,
Supt. Albany G. L. Co.

OFFICE DETROIT GAS-LIGHT CO.,
Detroit, Mich.

* * * I am delighted with the working of FLOYD'S PATENT MALLEABLE IRON RETORT COVERS. Since their use we have not had a single "blow" of the luting, and consequently have lost no Gas using these Covers. I shall substitute these Covers as soon as the old ones are broken. I am not sure but it would be more profitable to throw our present cast iron ones away and purchase yours. * * * * (Signed,) P. E. DE MILL,
Sect'y D. G. L. Co.

Extract from the Report of the Superintendent of the RICHMOND (VA.) GAS WORKS, *February* 28th, 1859.

"Feeling satisfied from my whole experience, that every facility which is afforded to working men in the performance of their duties, is an advantage to those who employ them, I have discarded the heavy old cast iron retort lids, weighing sixty pounds a-piece, and substituted those of malleable iron, made by S. C. Herring, of the Oregon Foundry, New York. These possess the important advantage of lightness, weighing only thirty pounds, and still greater of durability, it being next to impossible to break them by the hardest usage to which they are subjected. Their first cost is twice as much as the others, but as these are easily broken, there can be no question but that, in the end, the new lids will be the cheaper."

Gas Works requiring these "COVERS" can send a correct drawing of the mouth-piece of their Retort, from which we can make the pattern, which will be charged at just its cost. The cost of the "COVERS" will invariably be *thirteen cents per pound*, delivered at any point in New York for shipment.

HERRING, FLOYD & KIBBE, MANUFACTURERS,
740, 742 and 744 Greenwich street, New York.

Castings of every description for Gas Works, by Herring & Floyd. Oregon Iron Foundry, New York.

SAMUEL DOWN,

Nos. 340, 342, 344 AND 346 WEST TWENTY-SECOND STREET,

NORTH RIVER, NEW YORK.

MANUFACTURER OF

WET AND DRY PATENT GAS METERS,

Pressure Registers, Pressure Indicators and Gauges, Station, Show, Customer and Experimenting Meters, and the Celebrated Testing Gas Holders * now used in the State of New York, in compliance with an Act of the Legislature.

ALSO,

THE PHOTOMETRICAL APPARATUS.

NEW YORK, June 25, 1859.

Mr. DOWN embraces this opportunity of returning his thanks to the Gas-Light Companies, Gas Engineers, and consumers generally, of the United States, the British Provinces, South America and Cuba, for the very liberal patronage he has received from them the past year, which has *greatly exceeded his most sanguine calculations;* the demand for his IMPROVED PATENT DRY GAS METERS having been, by *many thousands*, greater than any previous year. Mr. Down being a *practical mechanic*, and having given his *entire attention*, for over EIGHTEEN YEARS, to the manufacture and improvement of Gas Meters, claims, without fear of contradiction, a superiority for the Gas Meters manufactured by him over all others in the country, for the proof of which he would simply revert to the fact that he has always manufactured for the *Manhattan and New York Gas-Light Companies all the meters used by them;* and at present is also manufacturing meters for the most extensive companies in the Union, the British Provinces, South America and Cuba. *All meters manufactured by him are tested and sealed by the Gas Meter Inspector of the State, appointed by the Governor under the act of the last Legislature.* His present factory was erected in 1847, and he believes it is the most complete and extensive at present in the world, and his machinery for gas meter making far in advance, in all the new improvements, of any other manufacturer's in the country. He therefore deems it highly necessary to place Gas-Light Companies throughout the Union, British Provinces, South America and Cuba *on their guard* against all parties who are so industriously endeavoring to introduce to their notice PATENT DRY GAS METERS, *constructed precisely in imitation of his;* but with *Chinese-like characteristics*, without fully understanding the correct principles upon which they are made. Mr. DOWN respectfully invites purchasers to visit for inspection, at any time, his works and the materials used by him in his manufacture of Gas Meters, feeling assured that the result of such inspection will be the *undoubted conviction* of the correctness of his statement.

In conclusion, he would state that he is now prepared to manufacture the PHOTOMETRICAL APPARATUS according to the correct ENGLISH STANDARD, and will furnish, gratuitously, the directions for arranging the Photometer Room and the rules for the proper working of the apparatus.

Mr. Down is fully prepared at all times to execute, upon the shortest notice, all orders for Gas Meters, wet and dry, and the Photometer Apparatus, with the guarantee of entire satisfaction.

Illustrative Electrotypes will appear in the second number of the American Gas-Light Journal.

* The standard of measurement of this Gas-holder is given by Professors Torrey, of the Assay Office; Joy, of Columbia College; Gibbs, of the Free Academy, with several other distinguished scientific gentlemen.

The American Gas-light Journal,

A MONTHLY.

FRIDAY, JULY 1, 1859.

OUR FIRST SUBSCRIBER.

We had the pleasure to receive from the NEW YORK GAS-LIGHT COMPANY, at the hands of its President, Wm. W. FOX, Esq., the FIRST APPLICATION for subscription to the JOURNAL. It was the more gratifying, because it had been intimated that that company especially, and perhaps the Manhattan, would look with disfavor upon any movement calculated to throw light on what has been considered hitherto a *dark* monopoly. But it was quite the reverse in both cases; for immediately on mentioning to Mr. Fox our desire for information, he gave it most cheerfully, and promised any further particulars that we might want, expressing, at the same time, his high appreciation of the importance of such a paper to the gas-light interest throughout the country. Mr. C. L. Everitt, too, the excellent Secretary, offered in the most courteous manner, to give us such statistics of the company's history as would interest our readers, which he has since done; they are crowded out of this number, but will appear in our next, together with others from CHARLES ROOME, Esq., President of the Manhattan Gas-Light Company, who has placed us under many obligations as well for the matter as for the manner of his favors.

TO SUBSCRIBERS.

THE JOURNAL will be issued on the first day of each month for the present. Its future will depend upon our observation of its influence throughout the Union, among those interested in the object of its mission. We may find it to be desirable hereafter to issue it more frequently, in which case advertisements will be inserted and the paper sent to the extent of numbers ordered.

It is our intention to enlarge and extend the JOURNAL, to keep pace with the requirements made upon it. All new inventions relating to the gas-light interest; all legal decisions affecting the rights of companies or consumers; all new and projected works—in fine, every item of intelligence affecting it, will be embraced in its columns: so that it shall be the standard authority, in this country, for that department of science.

A remittance of THREE DOLLARS will ensure the receipt of the JOURNAL for one year, postage prepaid. Yearly advertisers will receive the JOURNAL gratis.

GAS LIGHT WORKS WANTED.

There are hundreds of small thriving towns in the United States that offer great inducements to contractors to build works. Wherever there is a population of 1,000 or over, in a growing village, among an industrious people, well-built Gas-light works cannot go wrong, provided the stock is not thoroughly *watered*, if the gas is. Water is as indispensible to the purity of gas as it is fatal to the value of the shares.

TO GAS-LIGHT COMPANIES.

We will thank the officers of all Gas-Light Companies not named in our List, to send us immediately such particulars of their affairs as will enable us to include them in our next Price Current. We will cheerfully and at once correct any inaccuracies on being apprised of them, and shall feel obliged by any suggestions of improvement. We will thank them also to distribute the copies sent herewith among their shareholders, every one of whom we expect to enrol as a subscriber.

WATERHOUSE & BOWER.—We direct attention to the advertisement of this firm. The number of works erected by them is a sufficient evidence of their success and ability.

COLLECTIONS.—We would call the attention of our Jobbing Houses and Merchants generally, as well as of Manufacturers, to our Collection Department, advertised on the opposite page. We have upwards of 1,200 reliable, prompt correspondents throughout the country, and we make collections in much less than Bank time, and as cheaply as any other responsible house. Our messengers deliver checks, with statements, every morning, to our dealers; and with any unpaid collections we give the reason assigned for their dishonor.

COLLECTION OF SUSPENDED DEBTS.—We place all our suspended collections in the hands of Mr. BENJAMIN STEPHENS, Jr., No. 67 Wall street, N. Y., a prompt and zealous young lawyer, who has managed our business of that description for some years with skill and success. We shall be happy to give the same direction to any collections that our correspondents wish prosecuted to judgment.

THE GAS STRUGGLE IN CORK, IRELAND.

The *London Journal of Gas-Lighting* of 24th May, (a prosperous and admirably conducted *Journal*, by-the-by), gives a graphic account of a fierce struggle between two rival gas-light companies in Cork for the monopoly of lighting that town. It says the competition arose from circumstances peculiarly Irish. Cork had been satisfactorily supplied for many years by the United General (English) Gas-light Company, to whom the public authorities had united on two occasions to express their thanks for their liberality and for the excellent manner in which the city was lighted. The company had voluntarily (voluntarily—think of it!) reduced their price from 7s. per 1,000 feet, the rate they were authorized to charge, to 6s.; and when, owing to the rise in coals, they made an advance to 6s. 8d., the consumers concurred in the reasonableness of the demand, and on that occasion one of the public addresses was presented to the directors. That 6s. per 1,000 feet was a fair price may be inferred from the fact that by an act of Parliament of last year the Waterford Gas-light Company was empowered to charge that rate, fixing the illuminating power at only ten sperm candles, while the U. G. Company supplied gas equal to fifteen. The immediate cause of the trouble arose from the power of the Commissioners for lighting the city being transferred to the Corporation, a factious clique, who determined to make the supply of gas a political question. (They must have some of our ex-Common Councilmen in the Cork Corporation, or else we some of theirs in ours. How like!) They strenuously endeavored to arouse animosity to "the Saxon," and to excite a national prejudice against the United General Company because they were English. Mr. Maguire, M. P. for Dungarvan, formed at once a patriotic company to light Cork with genuine Irish gas—the genuine article being, very characteristically, made of English coal, with English materials, and by a Scotch engineer. The price was to be 5s. per 1,000. It was not the low price, however, that the agitators cared for; and when the English company reduced their charge to 5s., and afterwards to 4s. 6d., the opposition was unabated; and, the *Journal* says, by means of false representations, by religious influences, by cajolery and intimidation, the new company was formed. They applied to Parliament for an act of incorporation, without success, and they then determined to proceed under the patronage of the Corporation (as they do here) to lay the pipes. The United General Company, exasperated by the malignant attacks upon them, made for the purpose of driving them from the city, reduced the charge below cost price, supplying private concerns at 2s. 6d. per 1,000 feet, and corresponding low offers were made for lighting the public lamps; but the intimidation on the consumers, who were threatened with being deprived of the custom of their fellow-citizens if they took the Saxon gas, compelled them to become, for a time, customers to the new company, at a charge of 4s. 6d. per 1,000 feet, for an inferior gas, too. At length the consumers, tired of paying double price for inferior gas, although patriotic, were returning gradually to the old company; but the ruinously low price the latter were charging made the accession of customers a loss rather than a gain to them, and a negotiation was therefore opened through the medium of Mr. Anderson, the engineer of the company, which resulted in the purchase of the works and good-will of the United General Company for £26,000, about one-half the capital invested in their works; the shareholders submitting to a confiscation of ten shillings in the pound on their investment, as the penalty for resisting the patriotic attack of the Common Council.

ROLLAND BREAD COMPANY.—This Institution opened its doors in the new Fifth Avenue Hotel, on the corner of 23d street and 5th avenue, on Saturday, 11th June, under the management of our friend Mr. Daniel Messinger. The bread is sweet, well kneaded, thoroughly baked, and of delicious flavor, and since the first delivery, early in June, has come rapidly into general use. It is the intention of the company, we believe, to sell rights of their patent for the several States. Why do they not adapt their ovens to be heated by gas? A visit to their beautiful rooms will repay the curious, and we are sure our friend Messinger will need no other support while he leans so gracefully on the Staff of Life.

OUR CIRCULATION.

The circulation of this number will be, as stated in another column, 10,000 copies, in addition to which we have orders from two firms for 500 extra copies each; from another for 300, and from others for 50, 30, 25, &c., &c., each; so that we may safely say the first edition will reach 12,000 copies. The interest which this publication will excite in this country, if we may judge from what we have seen since the first day of June—no publicity whatever having been given to it—leads us to count upon a large increase upon the highest figures named, as our permanent future.

JOHN B. MURRAY. JOHN W. BROWN

JOHN B. MURRAY & CO.,

BANKERS,

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ALABAMA,	MINNESOTA,
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CANADA,	NEBRASKA,
CENTRAL AMERICA,	NEWFOUNDLAND,
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CUBA,	NEW JERSEY,
DELAWARE,	NEW YORK.
DISTRICT OF COLUMBIA,	NORTH CAROLINA,
FLORIDA,	NOVA SCOTIA,
GEORGIA,	OHIO,
JAMAICA.	OREGON,
ILLINOIS,	PENNSYLVANIA,
INDIANA,	RHODE ISLAND,
IOWA,	SOUTH AMERICA,
KANSAS,	SOUTH CAROLINA,
KENTUCKY,	TENNESSEE,
LOUISIANA,	TEXAS,
MAINE,	UTAH,
MARYLAND,	VERMONT,
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DRAFTS ISSUED for large or small amounts payable at Banks in every city in the Union.

SPECIAL ADVERTISEMENTS.

AS SUPERINTENDENT.—A competent, practical gas-maker wants a situation to take the entire charge of Gas Works Address SUPERINTENDENT, office of the AMERICAN GAS-LIGHT JOURNAL.

TO CONTRACTORS.—A Gas-Light Company, having a favorable charter, with thirty years monopoly, and a majority of the shares subscribed, will contract with a responsible and experienced party to build the works, taking a liberal payment in stock. For particulars, address Roswell G. Barlow, Chicago, Ill.

SECOND-HAND GAS HOLDER WANTED, forty to fifty feet in diameter, and in good order. L. F. Garrison, New York Post Office.

COKE FOR SALE.—Apply to the Engineer of the New York Gas Light Co., bet. 21st and 22d Sts., E. R.

SEWING MACHINES.—We call attention to these admirable Machines. Their superiority and variety of style and finish, and reduced cost, render them a positive necessity to all classes. They are advertised on page 8, and we recommend them to the especial attention of families throughout the country.

STATION METERS FOR SALE.—Two station meters; one to register 300,000, and one 500,000 feet per day. Apply to the Engineer of the Manhattan Gas-Light Co., at the Works foot of Eighteenth street, North River.

GAS-LIGHT STOCKS FOR SALE.—We have a variety of city gas-light stocks for sale throughout the Union. Parties wishing to sell or buy will please address

JOHN B. MURRAY & CO.,
No. 40 Wall street, N. Y.

COKE FOR SALE—At the works of the Manhattan Gas-Light Company, 18th street station, corner Tenth avenue and 18th street; and 14th street station, corner Avenue C and 14th street. $2 50 per chaldron in the yard. Cartage seventy-five cents.

MR. SAMUEL DOWN'S METERS.—Being unable to give Mr. Down an outside page in this number, his attractive advertisement will be found on page 7, to which we beg reference. He is preparing wood engravings illustrative of his Gas Meters, Photometers, Indicators, &c., which will be electrotyped to appear conspicuously in our next. We hope to do justice hereafter to all our friends, and will continue to enlarge the JOURNAL to meet every requirement.

EARLY HISTORY OF GAS LIGHTING.

HUGHES in his excellent Treatise on Gas Works, says: The discovery and earliest observations of elastic aëriform fluids capable of being inflamed and of imparting light and heat, must have been of great antiquity. The most ancient writings contain notices of inflammable vapors springing from fissures and cavities in the earth.

It is evident, therefore, that no such person as the discoverer or inventor of gas ever existed.

Modern chemistry has proved that all inflammable gases, whether rising naturally from rocks or produced artificially by combustion or otherwise, are composed of very simple elements, and all present a remarkable analogy to the common carburetted hydrogen, which is the gas chiefly burnt in our street lamps and houses at the present day.

INFLAMMABLE GAS COEVAL WITH THE CREATION.

Inflammable gas may be truly said to be as old as the first creation of organic matter, for wherever animal or vegetable substances have existed, they have been subject, by the immutable laws of nature, to decomposition, and whenever decomposition has taken place, a variety of gases has been produced, some of them inflammable and others not so. Gas may, with truth, be called a more natural production than steam, although this latter has existed from the first creation of water, and in its palpable state, as proceeding from boiling water, must have been observed in all ages; and in this connection, the discoveries of man with respect to gas and steam, ought rather to be called APPLICATIONS, not discoveries.

It was not till modern chemistry had exploded ancient dogmas, and had taught us the laws according to which elements are combined, in order to constitute all forms of matter, that it began to be seen that the inflammable vapor of coal, wood, oils and other fatty substances, was analogous with the marsh gas which arises in bubbles from the decomposition of vegetation under water; that it was really the same as the gas which arises from the decomposition of water, however produced; and that in fact one of the constituents of water, the greatest antagonist and extinguisher of flame, was itself the most inflammable substance in nature, namely, hydrogen gas; while oxygen, the other element of water, is the greatest known supporter of combustion.

PERPETUAL FIRES OF GREECE.

Perpetual fires are mentioned by Strabo and Plutarch, and other Greek writers, as emanating spontaneously from solid rock. Herodotus, Ctesias and Vituminous, mention the bituminous wells of Zakunthos, the modern island of Zante; and Ælian and Plutarch alluded to "springs of fire" issuing from the earth near Appolonia and Hamadan.

There are many other instances of inflammable gases issuing from the surface of the earth which are supposed to have their origin in beds of coal or carbonaceous schists of vegetable formation.

FIRST OBSERVATION OF COAL GAS.

In 1667, Mr. Shirley describing a spring arising in the coal district of Wigan, in Lancashire, England, proved that although the vapor on the surface could be inflamed, it was not the water which burnt but the gas by which it was accompanied; and he traced the origin of the gas itself directly to the beds of coal abounding there. Although these observations of Mr. Shirley pointed clearly to the possibility of procuring the same kind of gas by the combustion of coal, the subject appears to have received no particular attention at the time, nor was it until many years after that another observer, prompted by this very same spring, instituted experiments of a practical nature in the distillation of coal.

CHINESE SYSTEM OF GAS-LIGHTING.

The Chinese are said to use at this day for economical purposes, the gas which escapes spontaneously from beds of bituminous coal. Within 30 miles from Pekin, is a coal field, and streams of gas rising naturally from the coal, are conveyed to adjoining salt works by means of bamboo tubes, and there used for the boiling and evaporation of the salt. Other pipes convey the gas intended for lighting the streets and houses.

FIRST DISTILLATION OF COAL GAS.

The first authentic record of an experiment on the distillation of coal, appears in Dr. Hale's work on Vegetable Statics in 1726, which states that from the distillation of 158 grains of Newcastle coal he obtained 180 cubic inches of air, which weighed 51 grains, being nearly one-third of the whole. This result which is rather more than 8,500 cubic feet per ton, agrees very nearly with the production of gas actually realized from Newcastle coal at the present day.

In the "Transactions of the Royal Society," in 1733, a communication appears from Sir James Lowther on the inflammable air issuing from the shaft of a coal mine near Whitehaven. The gas was collected into an air-tight pit, and conveyed by means of a tube two inches square to a height of twelve feet above the surface of the ground, where frequent experiments were made upon it.

In 1765, a proposition was made to the magistrates of Whitehaven, by the then agent of Lord Lounsdale, to convey this same gas through pipes to light the streets of the town, which was refused by the magistrates, although the proposer proved its entire practicability by conveying the gas into his own office and lighting it therewith.

To Dr. Waters, Bishop of Llandaff, we are indebted for the first notice of the important fact that coal gas retains its inflammability after passing through water, being the result of his experiments in the second volume of his Chemical Essays, published in 1767, to which properly is due much of the facility with which the manipulations of a gas-making establishment are carried on, particularly those connected with the hydraulic main and with the purification by means of wet lime.

For nearly half a century more, the subject appears to have again slumbered, till about 1790, Mr. William Murdoch turned his attention to it in a truly practical form, and to him is awarded the exclusive merit as his unquestionable claim to the first practical application of artificially manufactured gas to the purposes of lighting.

ITS FIRST APPLICATION TO USEFUL PURPOSES.

It appears from the statement of Dr. Harvey, whose researches into the nature of aeriform fluids have gained for him the admiration of all Europe, that in 1792, Mr. Murdoch actually lighted his own house and office at Redworth with gas. He distilled the coal in iron retorts, and conveyed the gas through tinned iron and copper tubes to a distance of 70 feet. He used portable gas, carrying it about with him in a bladder or in bags of leather or varnished silk, and also in vessels of tinned iron fitted with a small metal tube and stop-cock, through which the gas issuing from a minute orifice, was ignited and made to serve as a lantern in travelling backwards and forwards between the mines and his own house.

Mr. Murdoch made also many experiments on various kinds of coal, and tried numerous forms of burners, till in 1798, he lighted up the Soho manufactory, and exhibited his experiments to persons who are still living and bear witness to his early labors. At the general Peace of Amiens in 1802, a part of the Soho manufactory was lighted with gas, which was probably the first public exhibition of the new method of lighting.

LIGHTING OF ALL THE SOHO WORKSHOPS.

Between this period and the year 1805, Mr. Murdoch appears to have further advanced the application of coal gas to useful purposes, by lighting up the whole of the workshops at Soho, and also erecting an apparatus for the same purpose at the largest cotton mills in Great Britain. The quantity of light supplied to these mills, was equal to that yielded by 2000 mould candles of six to the pound, or about 2500 cubic feet per day on the average of the whole year. To produce this quantity he used 7 cwt. of Wigan cannel coal, yielding at the rate of 7143 cubic feet of gas per ton of coal, considerably less than the quantity made at the present day from the same coal. The whole of the burners erected in the cotton mills amounted to 271 argands, each of which gave a light equal to four mould candles of six to the pound, and 633 cockspur burners, each of which gave a light equal to 2¼ of the same candles. The cockspur burner he describes as consisting of a small curved tube, with a conical end having three circular perforations about one-thirteenth of an inch in diamnter, one at the point of the cone and two lateral ones.

COMPARATIVE COST OF CANDLES AND GAS.

In his details of the comparative cost of lighting this establishment with gas as compared with candles, taking an average of two hours per day throughout the year, Mr. Murdoch says, the expense of candles would be £2,000 per annum, while the cost of gas, including every expense of wear and tear, and interest on capital, did not exceed £600 a year. On an average of three hours per day, the expense of candles was £3,000 a year, while that of gas amounted to £650.

Mr. Murdoch's success enlisted, of course, a host of ingenious and speculative persons, and in the years 1804 and 1805, the subject was taken up by eminent chemists, who illustrated by ingenious contrivances, how readily and economically gas could be used as a substitute for oil and candles. Among the prominent advocates of the new mode of lighting was a Mr. Winsor, who, it is said claimed the invention for himself, he having exhibited and lighted lamps in Pall Mall, and although he must be denied the merit of an inventor, he nevertheless did excellent service by rousing public attention to the subject with unvaried energy and good results. This bold and enthusiastic champion of gas-lighting, has been termed one of the wildest and most extravagant projectors that ever came before the public. He projected a scheme called the National Light and Heat Company, in which he gravely declared that an investment of £5 in this Company, would gain to the fortunate subscriber an income of £570 per annum, and among secondary ends to be attained by the new mode of lighting and heating was the entire abolition of smoke, and consequently of chimney sweeping. The national debt was also to be paid off, and an incredible revenue raised by government from a tax on the products to be obtained from coal. These brilliant hopes evaporated into thin air, and after squandering large sums of public money, subscribed to further his plans, he died poor and neglected.

MR. CLEGG'S SYSTEM.

Another individual now comes forward of a widely different stamp; one, too, who rendered important service, and to whom some of the best contrivances and ingenious applications are due. This was Mr. CLEGG, a pupil in Boulton & Watt's mechanical establishment at the time of Mr. Murdoch's engagement there. In the years 1807 and 1808, Mr. Clegg, after lighting several other cotton mills, proceeded to erect new gas works at the Catholic College at Stonyhurst, in Lancashire, where he first introduced the system of purifying the gas from carbonic acid and sulphuretted hydrogen, by passing it through lime in a separate vessel. The main features in the present system of gas-lighting, which are due to Mr. Clegg, are the system of wet lime purification, the hydraulic main, with its contrivance of dip-pipe for isolating the retorts, the present mode of attaching the mouth-pieces to the retorts, and the governor or regulator for adjusting the delivery of gas into the mains, and the gas meter in its earliest and most novel form.

From the year 1808 the names connected with gas works became so numerous, and inventors multiplied so fast, that it would be impossible to follow them.

From the year 1809 to 1815, the new mode of lighting was steadily gaining favor with the public. Many private establishments erected gas-works of their own, and several public gas-light companies were formed, particularly the Chartered Gas-Light Company, established in 1809, for the purpose of lighting London and Westminster. The first engineers appointed to carry out this work having failed in their attempt, Mr. Clegg was eventually appointed to supersede them and the works were completed under his direction.

In 1813, Westminster bridge was lighted with gas, and the year following the streets of St. Margaret's Parish, Westminster, was the first to apply for that change.

In the year 1814, gas was first applied to the purpose of ornamental illumination, when the allied sovereigns visited England in commemoration of the Peace of Europe, a magnificent pagoda was illuminated in St. James Park. In a single instant 10,000 lights burst forth and formed an immense and brilliant fountain of fire.

THE MOST ACTIVE PERIOD OF GAS-LIGHTING.

Between the years 1815 and 1823, many public companies were formed in the metropolis, and provincial towns; other companies were established to make gas from oil and fat, all of which, after prolonged and expensive trials, have failed.

LONDON PORTABLE GAS COMPANY.

In 1819, Mr. David Gordon obtained a patent for compressing gas into suitable vessels, with proper valves, and capable of being carried about, which was found to be impracticable, and the company was at length broken up. About the same time Professor Daniel, F. R. S., engaged in an unsuccessful attempt to make gas from rosin.

BRISTOL LIGHTED WITH GAS.

In 1823, the Act for lighting Bristol with gas, in spite of the warnings of eminent gas engineers, that the project would prove unsuccessful.

PRICE OF GAS IN LONDON.

Few of the companies in the metropolis charge now more than 4s. 6d. (one dollar) per 1000 feet for gas, while the price a few years ago ranged from 8s. to 10s. sterling.

THE GAS-FITTER.

The business of the gas-fitter has been created since the introduction of gas-lighting. It is one of great skill and nicety when we consider the difficulty of confining in metallic pipes a subtile aeriform fluid of only half the specific gravity of common air, in addition to the use of innumerable cocks and burners, all of which are so neatly joined as to render the presence of gas entirely imperceptible.

We have thus embodied almost verbatim, the history of gas-lighting in England, as recorded by Mr. Hughes. In our next number, we shall give an accurate and interesting account of its introduction into this country, with statistics of its rise and progress.

By reference to our Tables on pages 2 and 3, it will be seen that the first company organized in the United States was at BALTIMORE, in 1816; the second at BOSTON, in 1822, and the third the NEW YORK GAS-LIGHT CO., in 1823.

TO BANKERS

We insert the name of a few of our own correspondents, and shall insert none but those whom we believe to be sound and reliable. Our list of correspondents to whom we send collections, comprises over 1,200 Banks and Banking Houses on this Continent, and the promptness, integrity and liberality with which they transact their business with us is worthy of all praise.

Our Collections, which are numerous and often large in amount, are remitted for promptly when paid, and if unpaid are returned to us with intelligent reasons for their dishonor, both which is often imparted to dealers. Debts are sometimes secured by knowing at once why a note or draft was not paid at maturity. We recommend the Bankers whose names we insert as prompt and reliable, and entirely deserving the confidence of correspondents.

GAS-LIGHT FOR RAILROAD CARS.

Why is not gas used more extensively for lighting railroad cars? Possibly the slowness of its introduction is due more to a want of appreciation of the advantages accruing, than to the mechanical difficulties involved. The smoking-cars of the night express trains on the New Haven Railroad have each two burners, capable of consuming, collectively, seven cubic feet of gas per hour. This gives *very nearly* light enough to read in all parts of the car, and at a cost for gas of 1¼ cents per hour.

The art appears to have reached a state of perfection which allows, or rather demands, its general introduction. Gas-light should become one of the institutions of night travel by railroad, so that the passengers may be allowed to see each other when the more attractive views through the windows are shut out.—*New York Daily Times.*

GAS PIPE FOR SALE.—Closing out stock at 60 per cent. discount.

LUCIUS LYON, 503 Broadway.

Miscellaneous.

UNITED STATES TRUST COMPANY,
No. 48 WALL STREET,
BANK OF NEW YORK BUILDING,
SECOND FLOOR.

CAPITAL $1,000,000.

INTEREST ALLOWED ON DEPOSITS:
By order of any Court in the State.....*five* per cent.
From individuals or corporations for a
period of six months.....*four* per cent.
If payable on a few days' notice.....*three* per cent.
Deposits may be made and withdrawn at any time, and will be entitled to interest for the whole time they may remain with the Company.

Executors, Administrators, or Trustees of Estates, and females unaccustomed to the transaction of business, as well as Religious and Benevolent Institutions, will find this Company a convenient depository for money.

JOHN A. STEWART, *Sec'y.* JOSEPH LAWRENCE, *Pres't.*

HILL, MAPES, HILL & CO.,
PORTABLE GAS WORKS,
No. 510 BROADWAY, NEW YORK.

GASOMETER RIVETS.

Every kind of Rivets used in Gasometers.
PHILLIPS & ALLEN,
Philadelphia.

MORGAN L. CURTIS,
MANUFACTURER OF GAS FIXTURES
OF EVERY DESCRIPTION,
No. 141 ELM STREET, NEW YORK.

J. & T. DONALDSON,
DEALERS IN
Gas Light Fixtures and Pipe,
No. 85 LEONARD STREET, NEW YORK.

CHARLES DUSENBURY,
GAS FIXTURES OF ALL KINDS
FITTED TO ORDER.
No. 119 Prince Street, New York.

GILLETT & HORTON,
Practical Gas Fitters
AND DEALERS IN GAS FIXTURES.
No. 252 CANAL STREET, NEW YORK.

ALFRED GWYNNE,
MANUFACTURER AND FITTER OF ALL KINDS OF GAS FIXTURES, &c.
No. 1033 Broadway, New York.

G. D. JARVIS & CORMERAIS,
GAS FIXTURES
OF EVERY KIND
MADE AND PUT UP TO ORDER.
No. 113 William street, and 61 Jo.hn street, N.Y.

COLT & WHITLESEY,
PRACTICAL GAS FITTERS.
GAS FIXTURES OF ALL KINDS,
No. 922 Broadway, New York.

SAMUEL T. McDOUGAL,
Gas Stoves and Cooking Apparatus.
No. 444 BROADWAY, NEW YORK.

JOHN COX & CO.,
IMPORTERS OF
ELEGANT GAS-LIGHT CHANDELIERS, &c,
696 BROADWAY, (COR. FOURTH ST.) N. Y.

CORNELL,
PLUMBER AND GAS FITTER,
No. 8 East Nineteeth st., N. Y.

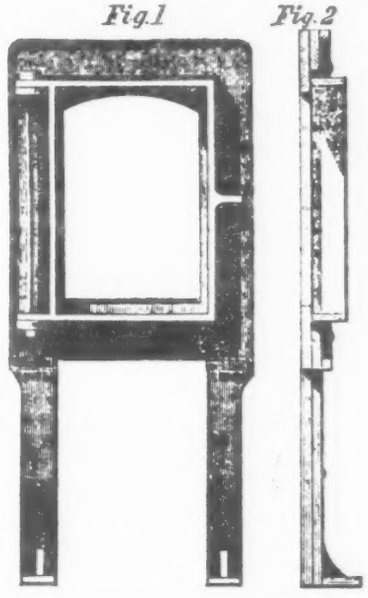
SABBATON'S

IMPROVED CAST-IRON GAS-RETORT AND FURNACE DOOR,

Arranged to protect the iron-work of the Door and Frame from direct contact with the fire.

Fig. 1 is a front elevation and Fig. 2 a section. The frame and door are constructed in such a manner that the opening of the frame is considerably larger than the furnace mouth, and the door frame itself, which is also somewhat larger than the furnace mouth, shuts up against the brick-work or against a false frame that is placed between the frame and brick work. The door is filled with fire-brick or a slab of fire-clay, which the

Fig.1 *Fig.2*



fire cannot injure. This only comes in contact with the fire; and as no air goes to the furnace in immediate contact with the lower part of the inside, a bank of unburnt coke or other fuel protects the inside of the lower part of the frame. One of these doors will last considerably longer than the ordinary ones, and the trouble and expense of replacing doors so frequently is saved.

For Sale only by **HERRING, FLOYD & KIBBE,**
SOLE PROPRIETORS.
740, 742, 744 *Greenwich Street, New York.*

SABBATON'S PATENT SCREENING SHOVELS,

For Coke, Anthracite and other Coals, Apples, Vegetables, &c. The best Shovel ever made for lifting any article which requires screening. Made in all sizes of a very superior quality of MALLEABLE IRON. Is much lighter, more durable and in every respect superior to wrought iron.

HERRING & FLOYD MANUFACTURE ALSO

Gas Compensators of all Sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half of those of English Manufacture. Also Castings of every Description for Gas Works, &c.

For Sale by **HERRING & FLOYD,**
740, 742, *and* 744 *Greenwich Street, New York.*

CLAY RETORTS.

The economical carbonization of coal has been the study of engineers since the introduction of gas-light. Many experiments were made in the early days of gas-lighting to effect improvements in the then existing plans of distillation, and while the size and shape of the retort, together with the distribution of heat, might be varied to suit the experimenter, the *material* seemed necessarily unchangeable.

The results of experiment and practice have decided the question as regards size and shape, as well as the application of heat, all depending upon the character of the coal to be carbonized.

The first clay retort was made and patented in England in the year 1820, by Mr. Grafton, who introduced them at the manufactory of Messrs. Butcher, Wolverhampton, since which time they have been gradually adopted in England, Scotland, Ireland, and on the Continent, almost to the exclusion of metal retorts.

Much opposition was brought to bear to prevent their use by parties interested in the sale of iron retorts, which at last culminated in a successful overthrow of a large number of them at one of the principal London works.

Mr. Samuel Clegg, Jr., in his valuable treatise on gas manufacture, supports the claims of clay retorts, as follows: "The advantages of fire clay retorts, combined with their greater durability, will ere long be generally acknowledged, and their use will consequently be more extensive. At the gas-works in Cambridge where from the beginning this kind of retort has been adopted in every variety of form, no retort has been changed, nor any new one erected for four years; the oldest in that establishment, which have been in operation upwards of seven years, remain perfectly sound, and continue as efficient for making gas as on the first day they were at work. In England and Scotland the fire clay retort has superseded the use of metal in no less than forty towns, in some instances they have lasted for the extraordinary period of twelve years; while, during this time, at all the other works where the invention is not yet used, it may be asserted that iron retorts have been renewed as many times.

"When properly constructed, these retorts are not liable to fracture, or the escape of gas, but are of such strength as to resist the greatest pressure which is likely to be put upon them. The coke also made by them is invariably of better quality, and produces less breeze or waste."

The above was published in the year 1841, since which date their adoption in Europe has become general.

The first that were tried in this country were imported by the Manhattan Gas Company of this city, the results then obtained were such as to warrant their adoption here, and now there seems little doubt but their use will prove economical.

The advantages they possess over iron are numerous. They cost less, save fuel, are more durable, and owing to the uniform heat produce a more reliable quality. They are more easily cleaned, from the fact that they do not oxydize, and require merely to be left open occasionally to burn off the carbonaceous deposit from their inner suface.

Mr. T. W. Parmele and Messrs. Elliman Brothers, of this city, have presented us with engravings of the most approved form of setting these retorts, showing exact dimensions and patterns of tiles, &c. The retorts for the sale of which Mr. Parmele acts as agent are manufactured by Mr. Joseph Cliff, who has the reputation of making the best fire goods in England, these retorts and those imported from Belgium by Messrs. Elliman Brothers, seem to be most thought of by those who have tested the work of different makers.

THE IMPERIAL GAS ACT, 1854. 17 VICTORIA, CAP. IV.

Sec. XVI.—All the gas supplied by the Company shall be of such quality as to produce from an Argand burner having fifteen holes and a seven inch chimney and consuming five cubic feet of gas per hour, a light equal in intensity to the light produced by not less than twelve wax candles of six in the pound, burning one hundred and twenty grains per hour.

We print as much of the recent law for the inspection of Gas Meters as will interest consumers:

An Act to provide for the Inspection and Sealing of Gas Meters, and for the Protection of Consumers of Illuminating Gas.

Passed April 14th, 1859, Three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. The Governor of this State shall nominate, and by and with the consent of the Senate, shall appoint an inspector of Gas Meters, who shall reside in the city of New York, whose duty it shall be, when required, to there inspect, examine, prove and ascertain the accuracy of any and all gas meters used or intended to be used for measuring or ascertaining the quantity of illuminating gas furnished by any gas-light company in this State, to or for the use of any person or persons, and when found to be or made correct, to seal, stamp or mark all such meters, and each of them, with some suitable device; such device shall be recorded in the office of the Secretary of State.

§ 2. Such inspector shall hold his office for the term of five years from the time of his appointment, and until the appointment of his successor, but may be removed by the Governor for sufficient cause; and he shall receive an annual salary of fifteen hundred dollars, to be paid in the first instance out of the State treasury on the warrant of the Comptroller.

§ 3. Such salary shall be charged to and paid into the State treasury by the several gas light companies in this State, in amounts proportionate to the amounts of the capital stock of said companies respectively, to be ascertained and assessed by the Comptroller of the State: and in case such gas-light companies, or any or either of them, shall refuse or neglect to pay into the State treasury the amount or portion of said salary which shall be by said Comptroller required of them respectively, for the space of thirty days after written notice given by said Comptroller to them respectively, to make such payment, then the said Comptroller may maintain an action in his name of office, in any court of this State, against any such delinquent gas-light company for their said portion or amount of such salary, with interest thereon at the rate of ten per cent. per annum, from the time when said notice to make such payment was given, and the costs of the action.

§ 4. It shall not be lawful for any corporation, company, or person, at any time after this Act shall take effect, to furnish and put in use any gas meter which shall not have been inspected, proved and sealed by said inspector, except during such time as said office of inspector shall be vacant, or said inspector, after request made, shall refuse or neglect to prove and seal the meters furnished for that purpose, and except the meters in use when this Act takes effect, and which may be removed for examination or repairs.

§ 5. That every such gas-light company shall provide and keep in and upon their premises a suitable and proper apparatus, to be approved and sealed by said inspector of meters, for testing and proving the accuracy of the gas meters furnished for use by said company, and by which apparatus every meter may and shall be tested, on the written request of the consumer, to whom the same shall be furnished, and in his presence if he desire it. If any such meter, on being so tested, shall be found defective or incorrect to the prejudice or injury of the consumer, the necessary removal, inspection, correction and replacing of such meter shall be without expense to the consumer; but in all other cases he shall pay the reasonable expenses of such removal, inspection and replacing; and in case any consumer shall not be satisfied with such inspection of the meter furnished to him, and shall give to the company written notice to that effect, he may have such meter re-inspected by the State inspector (if he require it) upon the same terms and conditions as above provided for the original inspection thereof.

Gardiner's Self-Lighting Gas Burners.—Agents wanted for the sale in every city of the Union. If blown out by accident or otherwise, will re-ignite. Office 197 Broadway, N. Y.

Miscellaneous.

JOHN NEWKUMET. PETER B. MELICK.

NEWKUMET & MELICK,

PHILADELPHIA FIRE BRICK WORKS,

Cor. of Vine and Twenty-third Sts.

Gas House Tiles to Suit all the different Plans in Use.

☞ Extra 9 inch Fire Bricks, equal to best English Bricks.

No. 1, 9 inch Fire Bricks. No. 2, 9 inch Fire Bricks. Arch, Bullhead, and Wedge Bricks, Cupola Bricks, Furnace Blocks, and Circular Bricks of all sizes.

Bakers' Tiles, 8, 10 and 12 inch Greenhouse Tiles. Furnace Blocks and Bricks, for Iron or Glass Works.

Ground Fire Brick, by the bbl.; Ground Fire Clay by the bbl,; Fire Sand by the load or bbl.

A large Assortment of Stove Tile on hand.

Heater Stoves, Range Tile, Section Bricks, &c., made on the most improved plan.

Gas-lighting by Electricity, and self-lighting Gas Burner.

S. GARDINER, Jr., *Patentee.*

No 167 Broadway, New York,

Orders for lighting churches, theatres, hotels, stores, and private dwellings promptly executed. Its practical working in houses in this city can be seen by applying to S. Gardiner, No. 167 Broadway, third floor front room. If blown out by accident or otherwise *this burner will re-ignite!* Agents wanted to sell by wholesale and retail.

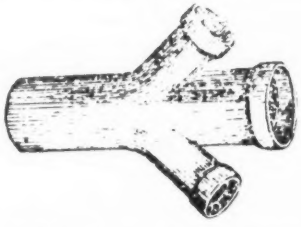
No. 167 Broadway.

Cliff's English Clay Retorts,

T. W. PARMELE, Sole Agent,

No. 4 Irving Place, New York.

Fire Bricks, Tiles, &c.



JAMES P. HAMMILL,

IMPORTER AND DEALER

In Best English Fire Brick, Floor, Malt, and Roofing Tiles, Drain Pipe, Gas Pipe, &c.

155 Water Street, New York City.

IRON, STEEL, &c.,

HANNIBAL GREEN,

TROY, N. Y.

(Near the Union Railroad Depot,)

Importer and Dealer in Iron and Steel, &c., &c.

Manufacturers of Steel Springs for Carriages and Railway Cars.

Orders executed for Gas Pipes and all materials used for Gas Works.

Bankers.

GEORGE PARISH OGDEN,
Banking, Exchange, and Collecting House,
Troy, N. Y.
Northern and Eastern Collections made and remitted for on day of receipt.

MANCHESTER & RICH,
BANKERS AND EXCHANGE DEALERS,
BUFFALO, N. Y.
Collections made on all points, with prompt returns.

WM. H. RICE & CO.,
BANKERS,
CHICAGO, ILL.
Collections made. Foreign and Domestic Exchange always on sale at lowest market rates.

LEWIS JOHNSON & CO.,
BANKERS,
WASHINGTON, D. C.
Collections made throughout the South and Southwest.

CRONISE & CO.,
Bankers, Bullion and Exchange Dealers,
PHILADELPHIA.
Collections made and remitted for promptly.

SPENCER, VILA & CO.,
BANKERS,
No. 13 CONGRESS STREET, COR. EXCHANGE PLACE, BOSTON.
Stocks, Bonds, and Business Paper negotiated, and special attention given to NEW ENGLAND COLLECTIONS.

JOHNSTON BROTHERS & CO.,
BANKERS,
BALTIMORE.
DEALERS IN UNCURRENT MONEY AND BULLION.
Business Paper negotiated and Collections made throughout the South and West.

DAVID A. McNAIR,
BANKER,
KALAMAZOO, MICHIGAN.
Particular attention paid to Collections throughout the West.

W. M. CORCORAN,
BANKER,
ST. PAUL, MINNESOTA.
Collections made throughout the Northwest.

TEALL & HINMAN,
BANKERS,
SYRACUSE, N. Y.
Dealers in Uncurrent Money. Collections promptly attended to.

LOOMIS & WHITWELL,
BANKERS,
JACKSON, MICHIGAN.
Dealers in Exchange and Currency. Collections attended to promptly.

WORK, McCOUCH & CO.,
Bank Note Exchange and Collection Office,
No. 36 SOUTH THIRD STREET,
PHILADELPHIA.

J. R. MORTON & CO.,
BANKERS,
NO. 29 WEST THIRD STREET,
Cincinnati, O.

SCHELL & HEMIUP,
Exchange, Collection and Banking Office,
GENEVA, N. Y.

JOHN H. ROCHESTER & BROTHER,
BANKING AND EXCHANGE OFFICE,
No. 11 EXCHANGE ST., ROCHESTER, N. Y.

Bankers.

N. HOLMES & SON,
BANKERS AND EXCHANGE DEALERS,
PITTSBURGH, PA.

AMERICAN BANK NOTE COMPANY.
CERTIFICATES OF GAS LIGHT SHARES
and Bank Notes Engraved with the greatest skill and promptness.
MERCHANTS' EXCHANGE BUILDING, WALL ST.,
NEW YORK CITY.

Incorporated Nov. 6, 1858.

DES MOINES COUNTY SAVINGS BANK.
BURLINGTON, IOWA.
AUTHORIZED CAPITAL, $500,000.
WM. JUDD, *Cashier.* W. W. WHITE, *Pres't.*
(Succeeding to the business of the late firms of White, Cook & Co., and White & Atherton.)

CITY BANK OF TOLEDO, OHIO.
KRAUS & SMITH.
Prompt personal attention given to Collections.
Domestic and Foreign Exchange and Land Warrants bought and sold.

MARSHALL & ILSLEY,
Bankers,
MILWAUKIE, WIS.
Collections solicited and remitted for promptly on day of payment.

McKIM & CO.,
BANKERS,
BALTIMORE, MD.
Bankers and Dealers in Foreign and Domestic Exchange. Collections made throughout the United States and Canadas, and remitted for on day of payment.

R. H. MAURY & CO.,
BANKERS,
Richmond, Va.
DEALERS IN FOREIGN AND DOMESTIC EXCHANGE, &C.
Collections made and remitted for on day of payment.

EXCHANGE and BANKING HOUSE
OF
MITCHELL & CABLE,
ROCK ISLAND, ILL.
All business appertaining to Banking and Collections promptly attended to.

MANHATTAN SAVINGS INSTITUTION,
No. 644 Broadway, New York.
Assets, January 1, 1859, $1,183,600.98.
Open daily from 9 A. M. to 7 P. M.
A. A. ALVORD, *Sec'y.* E. J. BROWN, *Pres't.*

HODGES & BAKER,
Exchange & Collection Office,
PORTSMOUTH, VA.

JAMES F. MELINE & Co.,
BANKERS,
No. 17, WEST THIRD STREET, CINCINNATI, OHIO.

Booksellers.

D. APPLETON & CO.,
Importers and Dealers in Foreign and American Books
Publishers of APPLETON'S RAILWAY GUIDE, and of APPLETON'S DICTIONARY OF MECHANICS,
A work indispensable to those interested in the manufacture of GAS AND GAS WORKS.
346 BROADWAY, NEW YORK.

JOHN COOK & CO.,
MANUFACTURERS OF THE BEST BLACK INK
It will not corrode the pen nor mould in the ink-stand.
A GENERAL ASSORTMENT OF STATIONERY ALWAYS ON HAND.
No. 42 Cedar Street, N. Y.

Sewing Machines.

WHEELER & WILSON'S
SEWING MACHINES,
No. 505 BROADWAY, N. Y
The very best in use. Send for a Circular.

LADD, WEBSTER & CO.,
No. 500 Broadway,
OPPOSITE THE ST. NICHOLAS HOTEL,
Invite public attention to their
IMPROVED TIGHT STITCH
SEWING MACHINES,
Which for beauty of construction, elegance of finish, and perfectness in Sewing, are unequalled by any in the market.

SINGER'S SEWING MACHINES.
New Styles---Prices Greatly Reduced.
No. 458 BROADWAY, N. Y.

GROVER & BAKER'S
CELEBRATED NOISELESS
SEWING MACHINES,
AT GREATLY REDUCED PRICES,
No. 495 BROADWAY, NEW YORK.

LESTER'S SEWING MACHINE,
LOCK-STITCH,
Prices from $50 to $150.
No. 483 BROADWAY, NEW YORK.

THE WILLCOX & GIBBS'
FAMILY SEWING MACHINES,
The best family machine in the market.
Prices from $30 to $50.
504 Broadway, N. Y.

Coal for Gas-works.

SAML. THOMPSON'S NEPHEW,
Importer of English, Cannel & Newcastle Coal,
No. 63 Pine, 145 Rivington, 149½ Seventh Av. & 45 Gold Street, New York.

BELLONI, FARRAR, & Co.,
DEALERS IN BITUMINOUS COAL, &c.,
No. 73 Wooster, 43 Pine, Ninth Av. cor. of Stuyvesant & foot West Twenty-third Street,
NEW YORK.

Gas Coal.—Penn Coal Co.
THE PENN COAL COMPANY having completed arrangements for mining and shipping Coal on an extensive scale, are now prepared to receive orders. The mines are favorably located on the line of the Pennsylvania Railroad, 26 miles east of Pittsburgh, Pa. The coal has been tested by many gas works, and the highest testimonials will be furnished. Communications addressed to the Penn Coal Company, Philadelphia, will have immediate attention.

English Gas Coals.
GEORGE WRIGHT & CO., LIVERPOOL.
T. W. PARMELE, SOLE AGENT,
No. 4 Irving Place, New York.

New York Belting and Packing Co.,
Manufacturers under Goodyear's Patent of
VULCANIZED RUBBER FABRICS,
ADAPTED TO MECHANICAL PURPOSES.
MACHINE BELTING, STEAM PACKING, HOSE, GAS FITTING, &c.
Nos. 37 and 38 Park Row, N. Y.
JOHN H. CREEVER, *Treasurer.*

P. TRAINOR.
Saddle and Harness Maker,
AND IMPORTER OF
English Saddlery,
No. 654 BROADWAY, NEW YORK.

NEW YORK CITY FIRE INSURANCE COMPANIES.

Corrected by JOHN B. MURRAY & Co., Bankers, New York.—June 30, 1859.

All of these Companies are advertised on the opposite Page, which see.

No.	Organised.	COMPANIES.	Capital.	Par val. of Shares.	Semi-Ann'l Div.	Payable.	Price.
1	1838	Adriatic	150,000	50	New	Jan. & July	90
2	1824	Ætna	200,000	25	6	Do.	110
3	1857	American	200,000	50	6	Do.	120
4	1859	American Exchange	200,000	100	New	March & Sept.	100
5	1853	Arctic	250,000	50	8	Jan. & July	116
6	1851	Astor	150,000	25	7	Feb. & Aug.	130
7	1851	Atlantic	150,000	50	10	March & Sept.	155
8	1835	Beekman	200,000	25	7	Feb. & Aug.	108
9	1858	Bowery	300,000	25	10	June & Dec.	163
10	1857	Brevoort	150,000	50	6	Jan & July	100
11	1847	Broadway	200,000	25	6	Feb. & Aug.	129
12	1837	Citizens'	150,000	20	12½	June & Dec.	210
13	1833	City	210,000	70	9	Feb. & Aug.	168
14	1850	Clinton	250,000	100	7	Jan. & July	110
15	1858	Columbia	200,000	50	6	Do.	103
16	1850	Commercial	200,000	50	10	June & Dec.	131
17	1853	Commonwealth	250,000	100	5	Jan. & July	101
18	1853	Continental	500,000	100	6	March & Sept.	150
19	1853	Corn Exchange	200,000	50	6	Do.	148
20	1805	Eagle	300,000	40	10	May & Nov.	138
21	1835	East River	150,000	15	6	June & Dec.	112
22	1850	Empire City	200,000	100	7	Jan. & July.	118
23	1823	Equitable	210,000	50	6	Do.	173
24	1853	Excelsior	200,000	50	6	Do.	105
25	1853	Exchange	150,000	17	18	Feb. & Aug.	109
26	1825	Firemen's	204,000	10	5	April & Oct.	143
27	1853	Firemen's Fund	150,000	25	10	May & Nov.	97
28	1853	Fulton	200,000	50	5	April & Oct.	141
29	1857	Gallatin	150,000	50	New	June & Dec.	90
30	1859	Gebhard	200,000	100	New	Jan. & July	95
31	1857	Germania	200,000	100	6	Do.	100
32	1857	Goodhue	200,000	25	10	Do.	103
33	1854	Greenwich	200,000	50	6	Feb. & Aug.	135
34	1850	Grocers'	200,000	50	6	March & Sept.	109
35	1852	Hanover	200,000	50	5	Jan & July	112
36	1853	Harmony	150,000	100	10	Do.	100
37	1853	Home	1,000,000	50	5	Do.	177
38	1856	Hope	150,000	50	15	Do.	106
39	1825	Howard	250,000	100	5	June & Dec.	196
40	1857	Humboldt	200,000	100	5	Jan. & July	104
41	1856	Importers' & Traders'	200,000	25	7	Do.	96
42	1852	Indemnity	150,000	50	5	Feb. & Aug.	96
43	1859	Irving	200,000	30	10	Do.	118
44	1824	Jefferson	200,000	50	5	Jan. & July	167
45	1857	Jersey City	150,000	40	8	Feb. & Aug.	118
46	1787	Knickerbocker	280,000	50	7	May & Nov.	125
47	1856	Lafayette	150,000	100	10	Jan. & July	110
48	1836	Lamar	300,000	25	6	Do.	118
49	1853	Lenox	150,000	100	10	Feb. & Aug.	95
50	1833	Long Island	200,000	25	8	Jan. & July	163
51	1852	Lorillard	200,000	50	15	Feb. & Aug.	130
52	1821	Manhattan	250,000	100	10	June & Dec.	168
53	1853	Market	200,000	50	17	Jan. & July.	125
54	1857	Mechanics	150,000	25	0	Do.	120
55	1853	Mechanics' & Traders'	200,000	50	8	Do.	145
56	1852	Mercantile	200,000	50	15	Do.	118
57	1850	Merchants'	200,000	100	6	Do.	175
58	1854	Metropolitan	300,000	50	7	May & Nov.	118
59	1857	Montauk	150,000	50	10	Jan. & July	112
60	1862	Nassau	150,000	37½	12	Do.	150
61	1838	National	200,000	25	8	Do.	200
62	1853	New Amsterdam	200,000	35	15	Do.	133
63	1855	New World	200,000	100	10	Jan. & July	101
64	1832	N. Y. Fire & Marine	200,000	50	5	Feb. & Aug.	145
65	1850	Niagara	200,000	150	10	Do.	153
66	1823	North American	250,000	50	8	Do.	122
67	1822	North River	350,000	25	8	June & Dec.	143
68	1851	Pacific	150,000	25	9	April & Oct.	135
69	1753	Park	200,000	100	10	Jan. & July	155
70	1851	People's	150,000	50	6	Do.	112
71	1853	Peter Cooper	150,000	20	8	Do.	106
72	1833	Phœnix	200,000	50	10	Do.	146
73	1855	Relief	150,000	50	8	March & Sept.	125
74	1852	Republic	150,000	100	6½	Jan. & July	100
75	1853	Resolute	200,000	25	8	Do.	112
76	1857	Rutgers	200,000	100	6	Feb. & Aug.	132
77	1858	Saint Mark's	150,000	25	10	Do.	126
78	1852	Saint Nicholas	150,000	25	5	Do.	97
79	1856	Security	200,000	100	7	Do.	124
80	1859	Standard	200,000	50	New	Jan. & July	100
81	1851	Stuyvesant	200,000	25	8	Feb. & Aug.	115
82	1824	United States	250,000	25	7	Jan & July	123
83	1850	Washington	200,000	50	15	Do.	150
84	1852	Williamsburgh	150,000	50	10	Do.	140

NEW YORK CITY BANK SHARES.

Corrected by JOHN B. MURRAY & CO., Bankers, New York.—June 30, 1859.

No.	BANKS.	Capital.	Par value of Shares.	Semi-Annual Div.	Payable.	Price.
1	America	3,000,000	100	3½	Jan. & July	119
2	American Exchange	5,000,000	100	3½	May & Nov.	103
3	Artisans'	600,000	100	3½	Do.	93½
4	Atlantic	400,000	100	3½	Jan. & July.	81
5	Atlantic, Brooklyn	500,000	50	5	Do.	120
6	Broadway	1,000,000	25	5	Do.	186
7	Bull's Head	173,800	25	4	April & Oct.	97
8	Butchers' & Drovers'	800,000	25	5	Jan. & July	119
9	Chatham	450,000	25		Do.	86
10	Chemical	300,000	100	6	Jan., Ap., Jul., Oct.	415
11	Citizens'	400,000	25	4	Feb. & Aug.	102
12	City	1,000,000	100	4	May & Nov.	121
13	City, Brooklyn	300,000	50	5	Feb. & Aug.	
14	Commerce	10,000,000	100	3½	Jan. & July.	100
15	Commonwealth	750,000	100	3½	Do.	100
16	Continental	2,000,000	100	3½	Do.	103
17	Corn Exchange	1,000,000	100	3½	Feb. & Aug.	102
18	Dry Dock	420,000	30	4	Jan. & July.	115
19	East River	206,525	25	3½	Do.	91
20	Fulton	600,000	30	5	May & Nov.	150
21	Greenwich	200,000	25	6	Do.	145
22	Grocers'	300,000	50	3½	Jan. & July.	94
23	Hanover	1,000,000	100		Do.	90½
24	Importers' & Traders'	1,500,000	100	4	Do.	115
25	Irving	500,000	50	3½	Do.	102
26	Leather Manufacturers'	600,000	50	5	Feb. & Aug.	135
27	Long Island, Brooklyn	400,000	50	5	Do.	147½
28	Manhattan	2,050,000	50	5	Do.	145
29	Marine	500,000	50	3½	Do.	87
30	Market	1,000,000	100	3½	Jan. & July.	107
31	Mechanics'	2,000,000	25	4	Do.	120
32	Mechanics, Brooklyn	300,000	50	5	Feb. & Aug.	
33	Mechanics' Banking Assoc'n	816,000	12½		May & Nov.	108
34	Mechanics' & Traders'	400,000	25	3½	Do.	110
35	Mercantile	1,000,000	100	5	Jan. & July.	125
36	Merchants'	2,700,000	50	3½	June & Dec.	109
37	Merchants' Exchange	1,285,000	50	3½	Jan. & July.	100
38	Metropolitan	4,000,000	100	4	Do.	112
39	Nassau	1,000,000	100	3½	Do.	101
40	Nassau, Brooklyn	300,000	100	5	Feb & Aug.	101
41	National	1,500,000	50	3½	April & Oct.	103
42	New York	2,500,000	100	3½	Jan. & July.	107
43	New York County	200,000	100	3½	Do.	105
44	New York Exchange	180,000	100	4		
45	North America	1,000,000	100	3½	Jan. & July.	112
46	North River	816,000	50		Do.	91
47	Ocean	1,000,000	50	3½	Feb. & Aug.	95½
48	Oriental	300,000	25	3½		101
49	Pacific	422,700	50	4	June & Dec.	122
50	Park	2,000,000	100	4	Jan. & July.	108
51	Peoples'	412,500	25	3½	Do.	104½
52	Phenix	1,800,000	20	3½	Do.	112
53	Republic	2,000,000	100	5	Feb. & Aug.	128
54	Saint Nicholas	750,000	100	3½	Do.	93½
55	Seventh Ward	500,000	50	5	Jan. & July.	126
56	Shoe and Leather	1,500,000	100	4	April & Oct.	113
57	State of New York	2,000,000	100	3½	May & Nov.	100
58	Tradesmen's	800,000	40	4	Jan. & July.	110
59	Union	1,500,000	50	3½	May & Nov.	98
60	Williamsburg City	500,000	50	5	Jan. & July.	106

REMITTANCES.

We credit Bank Notes from correspondents at the following discount:—July 1, 1859:

	per cent.		per cent.
Baltimore	¼	New England	1-10
Canada	¼	New Jersey (except Free Banks)	¼
Delaware, 5s. and up	¼	New York State	¼
Illinois	3	North Carolina	¼
Indiana	1¼@	Ohio	¼
Kentucky	¼	Pennsylvania	¼@¾
Louisiana	1	Philadelphia	¼
Maryland	¼	South Carolina and Georgia	¼
Michigan	¾	Tennessee	1
Missouri	1¾	Virginia	¼
Mobile	1	Wisconsin	3

LAND WARRANTS.

	BUYING.	SELLING.
160 acres	83	86
120 acres	73	76
80 acres	85	90
40 acres	110	110

FOREIGN EXCHANGE.

London—110¼ Paris—5130510.

TO INSURERS AGAINST FIRE.

The above list of Fire Insurance Companies comprises only the best institutions in this city, and those in which parties abroad may feel the utmost confidence, as do our own citizens. The Directors are probably unknown in the remote parts of the country, and the space their names would occupy is so valuable we deem it an unnecessary expense to publish them.

Applications, with diagrams, addressed to any of the Companies named will be as promptly and as honorably treated as if made in person. It will be observed that we state the Assets of the Companies, in some cases, their surplus being greater than their original capital, and injustice is often done the strongest old companies by classifying them by their capital with the smallest new ones. The Companies are numbered in the above list to correspond with their advertisements.

Manhattan Savings Institution.—Deposits and payments are made promptly at this institution every day. No detention nor delay is requisite.

Good Ink.—We recommend the Ink advertised by Messrs. John Cook & Co., as a free, pure ink, desirable as well for books as for correspondence.

Gas-Meter Explosion.—A large gas-meter belonging to the Cambridge Gas-Light Works, exploded on Washington street, Boston, on 23d June. G. R. Darracott had a leg broken in two places. John Campbell was fatally injured internally, and Daniel Eaton had an arm broken.

A Country Gas-Light Company wishes to engage as Engineer or Superintendent a practical Gas-maker. Address, with references, Gasometer, P.O., Baltimore.

Fire Insurance Companies.

1. ADRIATIC,
Continental Bank Building, New York.
CAPITAL $150,000.
F. W. Lewis, *Sec'y.* John A. Luqueer, *Pres't.*

2. ÆTNA.
No. 56 Wall street, New York.
CAPITAL $200,000.—ASSETS $244,000.
Liv'n Satterlee, *Sec'y.* Jacob Brouwer, *Pres't.*

3. AMERICAN,
No. 49 Wall street, New York.
CAPITAL $200,000.
Fred. W. Downer, *Sec'y.* Jas. M. Halsted, *Pres't.*

4. AMERICAN EXCHANGE,
No. 128 Broadway, New York.
CAPITAL $200,000.
Jas. M. Bates, *Sec'y.* Saml. Brown, *Pres't.*

5. ARCTIC,
No. 29 Wall street, New York.
CAPITAL $250,000.—ASSETS $300,000.
Rich. A. Oakley, *Sec'y.* Albert Ward, *Pres't.*

6. ASTOR,
No. 16 Wall street, New York.
CAPITAL $150,000.—ASSETS $211,000.
Robt. D. Hart, *Sec'y.* Wm. T. Pinckney, *Pres't.*

7. ATLANTIC,
No. 14 Wall street, New York.
CAPITAL $150,000.—ASSETS $257,500.
Horatio Dorr, *Sec'y.* John D. Cocks, *Pres't.*

8. BEEKMAN,
No. 8 Wall street, New York.
CAPITAL $200,000.—ASSETS $223,101.
Steph. H. Conger, *Sec.* Benj. W. Benson, *Pres't.*

9. BOWERY,
No. 124 Bowery, New York.
CAPITAL $300,000.—ASSETS $352,500.
G. Taylor, *Sec'y.* Wm. Hibbard, *Pres't.*

10. BREVOORT,
No. 70 Wall street, New York.
CAPITAL $150,000.—ASSETS $170,000.
Jas. C. Harriott, *Sec'y.* Richd. Oakley, *Pres't.*

11. BROADWAY,
No. 433 Broadway and 4 Wall st., New York.
CAPITAL $200,000.—ASSETS $285,000.
John Wray, *Sec'y.* Hiram M. Forrester, *Pres't.*

12. CITIZENS',
No. 67 Wall and 58 Bowery, New York.
CAPITAL $150,000.—ASSETS $316,500.
Jas. M. McLean, *Sec'y.* Dan'l Burtnett, *Pres't.*

13. CITY,
No. 62 Wall street, New York.
CAPITAL $210,000.—ASSETS $345,000.
Sam'l Townsend, *Sec'y.* Geo. S. Fox, *Pres't.*

14. CLINTON,
No. 52 Wall street, New York.
CAPITAL $250,000.—ASSETS $293,000.
Jas. B. Ames, Jr., *Sec'y.* Hugh Laing, *Pres't.*

15. COLUMBIA,
No. 10 Wall street, New York.
CAPITAL $200,000.—ASSETS $218,492.
John C. Bergh, *Sec'y.* Benj. D. Brush, *Pres't.*

16. COMMERCIAL,
No. 49 Wall street, New York.
CAPITAL $200,000.—ASSETS $262,000.
M. V. B. Fowler, *Sec'y.* Joseph Petit, *Pres't.*

17. COMMONWEALTH,
No. 6 Wall street, New York.
CAPITAL $250,000.—ASSETS $262,000.
Thos. L. Chester, *Sec'y.* Joseph Hoxie, *Pres't.*

18. CONTINENTAL,
No. 18 Wall street, New York.
CAPITAL $500,000.—ASSETS $875,000.
H. H. Lamport, *Sec'y.* Geo. T. Hope, *Pres't.*

19. CORN EXCHANGE,
No. 13 William street, New York.
CAPITAL $200,000.—ASSETS $208,500.
W. H. Windsor, *Sec'y.* Jos. Ketchum, *Pres't.*

20. EAGLE,
No. 71 Wall street, New York.
CAPITAL $300,000.—ASSETS $330,000.
Alex. J. Clinton, *Sec'y.* Jas. N. Cobb, *Pres't.*

21. EAST RIVER,
No. 69 Wall street, New York.
CAPITAL $150,000.—ASSETS $185,000.
Thos. Palmer, *Sec'y.* Chas. H. Birney, *Pres't.*

Fire Insurance Companies.

22. EMPIRE CITY,
No. 54 Wall street, New York.
CAPITAL $200,000.—ASSETS $265,000.
Wm. A. Burtis, Jr., *Sec.* Lindley Murray, *Pres.*

23. EQUITABLE,
No. 59 Wall Street, New York.
CAPITAL $210,000.—ASSETS $320,000.
John Miller, *Sec'y.* Rich'd J. Thorne, *Pres't.*

24. EXCELSIOR,
No. 6 Broad Street, New York.
CAPITAL $200,000.—ASSETS $250,000.
H'y Quackenboss, *Sec.* Eugene Plunkett, *Pres.*

25. EXCHANGE,
No. 88 Wall Street, New York.
CAPITAL $150,000.—ASSETS $196,300.
R. C. Combes, *Sec'y.* Jas. Van Norden, *Pres't.*

26. FIREMEN'S,
No. 83 Wall Street, New York.
CAPITAL $204,000.—ASSETS $275,000.
J. V. Harriott, *Sec'y.* Francis T. Luqueer, *Pres't.*

27. FIREMEN'S FUND,
No. 108 Broadway, New York.
CAPITAL $150,000.—ASSETS $164,688.
H. Beeckman, *Sec'y.* Nathan B. Graham, *Pres't.*

28. FULTON,
No. 40 Wall Street, New York.
CAPITAL $200,000.—ASSETS $290,000.
Jas. M. Rankin, *Sec'y.* Wm. A. Cobb, *Pres't.*

29. GALLATIN,
No. 34 Wall Street, New York.
CAPITAL $150,000.—ASSETS $157,500.
H. Baldwin, *Sec'y.* D. Clarkson, *Pres't.*

30. GERHARD,
No. 19 Nassau st. & 34 Av. cor. 25th st., N. Y.
CAPITAL $200,000.—ASSETS $230,000.
J. R. Smith, *Sec.* Wm. D. Waddington, *Pres't.*

31. GERMANIA,
No. 5 Beekman street, New York.
CAPITAL $200,000.
R. Garrigue, *Sec'y.* Maurice Hilger, *Pres't.*

32. GOODHUE,
No. 34 Wall street, New York.
CAPITAL $200,000.—ASSETS $212,400.
John D. Burtnett, *Sec'y.* Robt. Bage, *Pres't.*

33. GREENWICH,
No. 400 Hudson street, New York.
CAPITAL $200,000.—ASSETS $228,1.8.
Jas. Harrison, *Sec'y.* T. Whittemore, *Pres't.*

34. GROCERS',
No. 48 Wall street, New York.
CAPITAL $200,000.—ASSETS $237,000.
Jas. G. Platt, *Sec'y.* Sampson Moore, *Pres't.*

35. HANOVER,
No. 45 Wall street, New York.
CAPITAL $200,000.—ASSETS $241,722.
B. J. Walcott, Jr., *Sec'y.* Doras L. Stone, *Pres't.*

36. HARMONY,
No. 50 Wall street, New York.
CAPITAL $150,000.—ASSETS $192,000.
Robt. O. Glover, *Sec'y.* Wm. Callender, *Pres't.*

37. HOME,
Nos 112 & 114 Broadway, New York.
CAPITAL $1,000,000.—ASSETS $1,400,000.
J. Milton Smith, *Sec'y.* Chas. J. Martin, *Pres't.*

38. HOPE,
No. 33 Wall street, New York.
CAPITAL $150,000.—ASSETS $182,000.
Thos. Greenleaf, *Sec'y.* Jacob Reese, *Pres't.*

39. HOWARD,
No. 68 Wall street, New York.
CAPITAL $250,000.—ASSETS $290,000.
Henry A. Oakley, *Sec.* Saml. T. Skidmore, *Pres't.*

40. HUMBOLDT,
No. 10 Wall street, New York.
CAPITAL $200,000.—ASSETS $238,000.
Wm. Mulligan, *Sec'y.* John Rankin, *Pres't.*

41. IMPORTERS' AND TRADERS',
No. 2½ Wall street, New York.
CAPITAL $200,000.
Frank W. Ballard, *Sec.* B. F. Manniere, *Pres.*

42. INDEMNITY,
No. 50 Wall street, New York.
CAPITAL $150,000.—ASSETS $160,800.
W. R. Sheldon, *Sec'y.* John Hone, *Pres't.*

Fire Insurance Companies.

43. IRVING,
No. 9 Wall street, New York.
CAPITAL $200,000.—ASSETS $244,000.
M. L. Crowell, *Secy.* Mason Thompson, *Pres't.*

44. JEFFERSON,
No. 60 Wall street, New York.
CAPITAL $200,000.—ASSETS $309,000.
Geo. Farmer, *Secy.* Moses Tucker, *Pres't.*

45. JERSEY CITY,
No. 9 Merchants' Exchange, New York.
CAPITAL $150,000.—ASSETS $190,922.
Jesse Paulmier, *Sec'y.* Geo. W. Savage, *Pres't.*

46. KNICKERBOCKER,
No. 64 Wall street, New York.
CAPITAL $280,000.—ASSETS $342,000.
Geo. Hodgsdon, *Secy.* Wm. Tucker, *Pres't.*

47. LAFAYETTE,
No. 14 Wall Street, New York.
CAPITAL $150,000.—ASSETS $190,000.
Anson S. Palmer, *Sec'y.* John H. Funk, *Pres't.*

48. LAMAR,
No. 68 Wall Street, New York.
CAPITAL $300,000.—ASSETS $260,000.
J. R St. John, *Sec'y.* Edw'd Anthony, *Pres't.*

49. LENOX.
No. 54 Wall Street, New York.
CAPITAL $150,000.—ASSETS $176,000.
David Drake, *Sec'y.* John G. Storm, *Pres't.*

50. LONG ISLAND,
No. 48 Wall Street, New York.
CAPITAL $200,000.—ASSETS $327,000.
W. W. Henshaw, *Sec'y.* B. W. Delamater, *Pres't.*

51. LORILLARD,
No. 31 Wall Street, New York.
CAPITAL $200,000.—ASSETS $242,170.
Geo. D. Crary, *Sec'y.* Carlisle Norwood, *Pres.*

52. MANHATTAN,
No. 68 Wall Street, New York.
CAPITAL $250,000.—ASSETS $380,000.
A. J. Smith, *Sec'y.* Wm. P. Palmer, *Pres't.*

53. MARKET,
No. 37 Wall Street, New York.
CAPITAL $200,000.—ASSETS $268,053.
H. P. Freeman, *Sec'y.* B. H. Howell, *Pres't.*

54. MECHANICS',
No. 31 Wall street, New York.
CAPITAL $150,000.—ASSETS $176,160.
Walter Nichols, *Sec'y.* Dan'l Chauncey, *Pres't.*

55. MECHANICS' AND TRADERS'
No. 84, Wall street, New York.
CAPITAL $200,000.—ASSETS $274,800.
Jas. R. Lott, *Sec'y.* Walter Underhill, *Pres't.*

56. MERCANTILE,
No. 65 Wall street, New York.
CAPITAL $200,000.—ASSETS $252,350.
John Baker, *Sec'y.* Wm. A. Thomson, *Pres't.*

57. MERCHANTS',
No. 197 Greenwich street, New York.
CAPITAL $200,000.—ASSETS $287,982.
J. L. Douglas, *Sec'y.* C. V. B. Ostrander, *Pres't.*

58. METROPOLITAN,
No. 108 Broadway, New York.
CAPITAL $300,000.—ASSETS $393,973.
Edw. A Stansbury, *Sec.* Jas. L. Graham, *Pres.*

59. MONTAUK,
No. 60 Wall street, New York.
CAPITAL $150,000.—ASSETS $190,000.
E Beers, *Sec'y.* J. J. Studwell, *Pres't.*

60. NASSAU,
No. 12 Merchants' Exchange, New York.
CAPITAL $150,000.—ASSETS $225,000.
A. J. Beekman, *Sec'y.* Wm. M. Harris, *Pres't.*

61. NATIONAL,
No. 52 Wall Street, New York.
CAPITAL $200,000.—ASSETS $315,000.
H. T. Browne, *Sec'y.* Thos. W. Thorne, *Pres't.*

62. NEW AMSTERDAM,
No. 7 Wall street, New York.
CAPITAL $200,000.—ASSETS $250,000.
W. H. Duesenberry, *Sec.* D. S. Manners, *Pres.*

63. NEW WORLD
No. 85 Pine street, New York.
CAPITAL $150,000.—ASSETS $232,000.
S. A. Patterson, *Sec'y.* Thos. A. Emmett, *Pres't.*

Fire Insurance Companies.

64. N. YORK FIRE & MARINE,
No. 72 Wall street, New York.
CAPITAL $200,000.—ASSETS $305,350.
D. Underhill *Sec'y.* O. H. Jones, *Pres't.*

65. NIAGARA,
No. 67 Wall street, New York.
CAPITAL $200,000.—ASSETS $310,000.
L. G. Irving, *Sec'y.* Jonathan D. Steele, *Pres't.*

66. NORTH AMERICAN,
No. 6 Wall street, New York.
CAPITAL $250,000.—ASSETS $320,150.
R. W. Bleecker, *Secy.* James W. Otis, *Pres't.*

67. NORTH RIVER,
No. 202 Greenwich street, New York.
CAPITAL $250,000.—ASSETS $364,000.
John Hegeman, *Sec.* Peter R. Warner, *Pres.*

68 PACIFIC,
No. 112 Grand st. and Wall st., New York.
CAPITAL $150,000.—ASSETS $238,290.
T. F. Jeremiah, *Sec'y.* Amos T. Hatfield, *Pres't.*

69. PARK,
No. 237 Broadway and 50 Wall st., New York.
CAPITAL $200,000. ASSETS $224,352.
Wm. Jaffray, *Sec'y.* J. W. Baker, *Pres't.*

70. PEOPLE'S,
No. 393 Canal and 66 Wall street, New York.
CAPITAL $150,000.—ASSETS $152,587.
Wm. Underhill, *Sec'y.* Matthias Clark, *Pres't.*

71. PETER COOPER,
Third avenue, cor. Ninth, & 61 Wall st., N. Y.
CAPITAL $150,000.—ASSETS $175,000.
Wm. H. Riblet, *Sec'y.* Nathan C. Ely, *Pres't.*

72. PHŒNIX,
No. 62 Wall street, New York.
CAPITAL $200,000.—ASSETS $280,000.
Philander Shaw, *Sec'y.* Steph. Crowell, *Pres't.*

73. RELIEF.
No. 9 Wall street, New York.
CAPITAL $150,000.—ASSETS $258,550.
J. H. Pinkney, *Secy.* A. S. Depeyster, *Pres't.*

74. REPUBLIC,
No. 16 Wall street, New York.
CAPITAL $150,000.—ASSETS $270,000.
Duncan F. Curry, *Sec'y.* Robt. S. Hone, *Pres't.*

75. RESOLUTE,
No. 19 Nassau street, New York.
CAPITAL $200,000.—ASSETS $254,000.
Wm. M. Randell, *Sec'y.* C. F. Uhlhorn, *Pres't.*

76. RUTGERS.
No. 176 Chatham, & 11 Merch. Ex., New York.
CAPITAL $200,000.—ASSETS $268,000.
E. B. Fellows, *Sec'y.* Isaac O. Barker, *Pres't.*

77. SAINT MARK'S.
No. 67 Wall street, New York.
CAPITAL $150,000.—ASSETS $187,000.
Wash'ton. Post, *Sec'y.* John M. Ferrier, *Pres't.*

78. SAINT NICHOLAS,
No. 10 Merch. Ex., & 91 Eighth Av., New York.
CAPITAL $150,000.—ASSETS $181,000.
Wm. S. Slocum, *Sec'y.* Wm. Winslow, *Pres't.*

79. SECURITY,
No. 31 Pine street, New York.
CAPITAL $200,000.—ASSETS $266,000.
Thos. W Birdsall, *Sec'y.* Jos. Walker, *Pres't.*

80. STANDARD.
No. 50 Wall street, New York.
CAPITAL $200,000.
Bradford Knapp, *Sec'y.* Wm. Cripps, *Pres't.*

81. STUYVESANT.
No. 151 Bowery, & 4 Broad street, New York.
CAPITAL $200,000.—ASSETS $243,000.
Benj. J. Pentz, *Sec'y.* Fred'k R Lee, *Pres't.*

82. UNITED STATES,
No. 69 Wall street, New York.
CAPITAL $250,000.—ASSETS $319,000.
Jas. Wilkie, *Sec'y.* Ab'm S. Underhill, *Pres't.*

83. WASHINGTON,
No. 54 Wall street, New York.
CAPITAL $200,000.—ASSETS $292,000.
Henry Weston, *Sec'y.* Geo. C. Satterlee, *Pres't.*

84 WILLIAMSBURG CITY,
No. 67 Wall street, New York.
CAPITAL $150,000.—ASSETS $226,567.
H. Giroux. *Sec'y.* Richard Teneyck, *Pres't.*

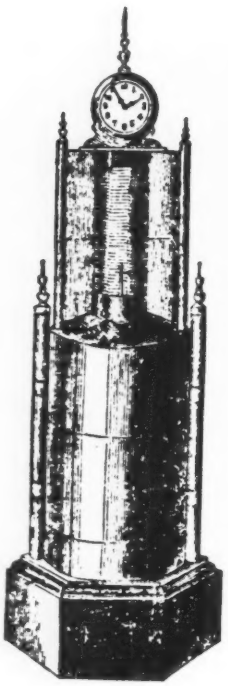
PRESSURE REGISTERS,

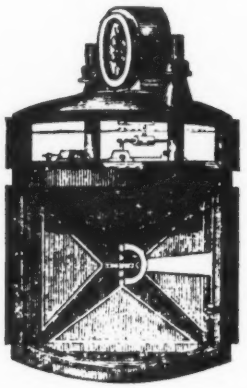
PRESSURE INDICATORS,

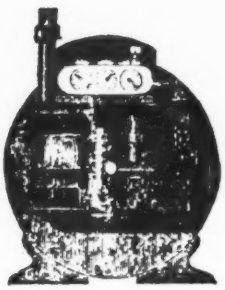
PRESSURE GAUGES,

GOVERNORS,

STATION METERS,







CUSTOMER METERS, (Wet and Dry,)

EXPERIMENTAL METERS, (Wet and Dry,)

SHOW METERS, (Wet and Dry,)

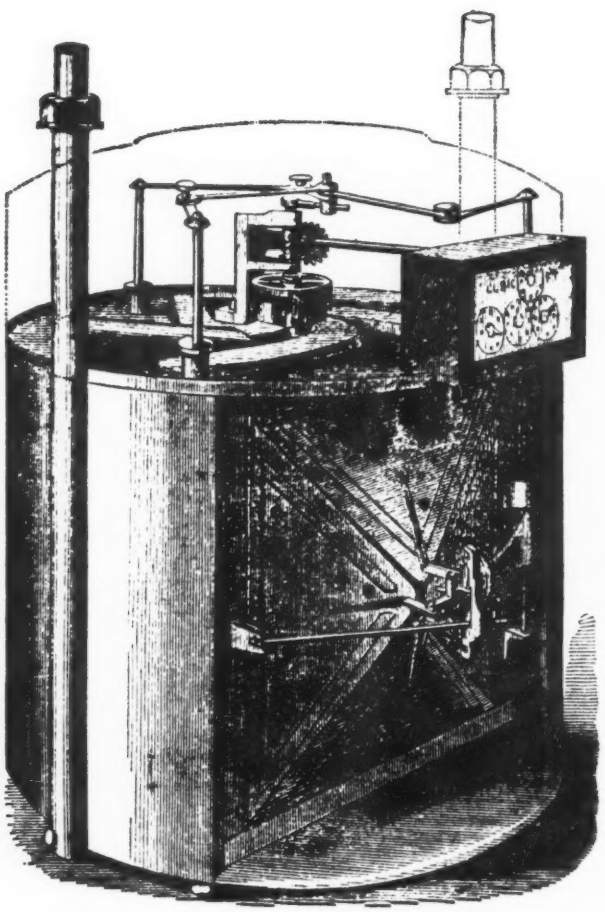
METER PROVERS,

CENTRE SEALS,

&c. &c. &c.

TO GAS-LIGHT COMPANIES AND GAS ENGINEERS.

An experience of more than twenty-two years, during which time we have manufactured a larger number of Gas Meters than any other establishment in the world, gives us confidence, in calling attention to the superior instruments, both wet and dry, we are now offering. We continue to use the best materials; the strictest attention is given to workmanship, and we guarantee satisfaction to all parties purchasing.



With a view to better satisfy persons who question the accuracy of our meters, we would state, **that we have each Meter tested (separately) by a sworn Meter Inspector,** and, if desired, will have them **sealed with his seal.** This may satisfy many complaining consumers and be no additional cost.

CODE, HOPPER & GRATZ,

1500, 1502 & 1504 FILBERT STREET,

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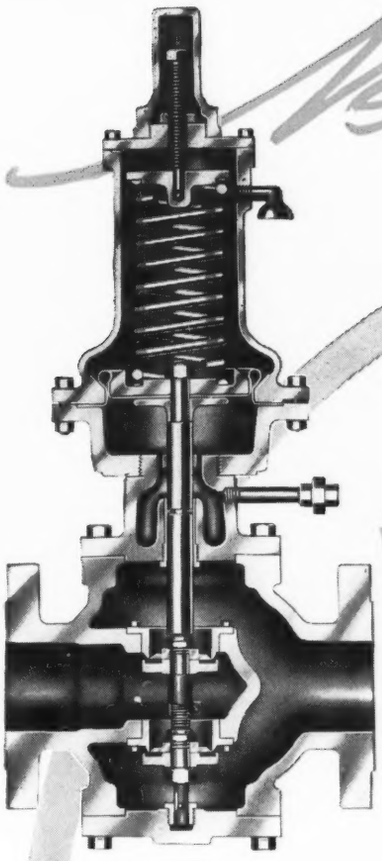
The above engravings were electrotyped expressly for the AMERICAN GAS-LIGHT JOURNAL.

New in principle!

CHAPLIN-FULTON

MODEL 441-57S

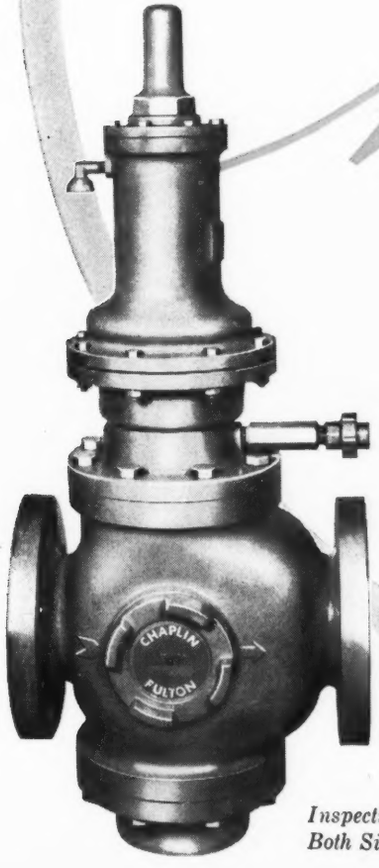
GAS REGULATOR



SIZE: 2"—3"—4"—6"
125 lb. iron—W. P. 175 psi
250 lb. ductile—W. P. 400 psi
Series 30 steel—W. P. 720 psi

Model 57-S, a simple spring loaded regulator, operates on a new diaphragm principle which will control accurately until the regulator is wide open. The outlet pressure "fall-off," typical of spring regulators, is eliminated—not by an uncontrolled velocity effect—but by a diaphragm which changes its size as the valve moves to give straight line control. For pounds-to-pounds service,—controlled pressures to 75 psi with same assembly.

New in design!



Inspection Plates Both Sides.

Also, a new body design—441—with gas exit areas greatly enlarged to prevent turbulence and increase capacity.
And to help in your visual inspection program—side inspection plates on *both* sides of the body have been included. Screwed-on with O-ring seal, they can be quickly removed and replaced—no gasket problem. Standard face-to-face dimensions now make the 441 interchangeable with other regulators.

ACCURATE CF MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
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59-2

BE SURE YOUR METERS ARE

EASY TO MAINTAIN

COMBINATION METER AND REGULATOR

BE SURE TO SPECIFY Sprague

The remarkably simple but dependable mechanism of the Sprague Meter saves you money two ways — First, you seldom need to make repairs because of Sprague's unique operating principle which practically eliminates wear. Second, Sprague simplicity makes servicing extremely easy — cuts your equipment and labor costs — speeds maintenance operations.

Start now to save money on maintenance and moderization. Be sure your meters are the easiest to maintain — be sure to specify Sprague.

Call or write your Sprague representative today.

The Sprague Combination Meter and Regulator is a compact dual-purpose unit which dependably regulates gas pressure and accurately measures the flow. It is neater looking, more efficient, and requires 60% less space than conventional arrangements.
The Combination is especially easy to maintain and inspect because of its basic simplicity and few moving parts. It will also save you considerable labor and material expense on conversion to a higher pressure system. Available in Iron Case or Aluminum Case. Sizes 175 and 240 cu. ft. Synthetic or leather diaphragms.

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